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THE FIRST TRANQUILIZER FOR USE IN ANIMALS GOING TO SLAUGHTER!

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Another major indication — another major market **for your services! With Jen-Sal Diquel, you and the livestock industry can join forces to reduce costly losses associated with shipping animals to market. Intraperitoneal injection of ½ - 1 cc. Diquel per 100 lb., not less than 24 hours prior to slaughter, produces rapid and safe tranquilization without leaving harmful residue in carcasses. Diquelized animals are more resistant to stress diseases, shrink less and arrive at their destination with fewer bruises and scarred hides. Diquel is conveniently packaged and economically priced for professional use or dispensing. Order today from your Jen-Sal Branch or representative.**

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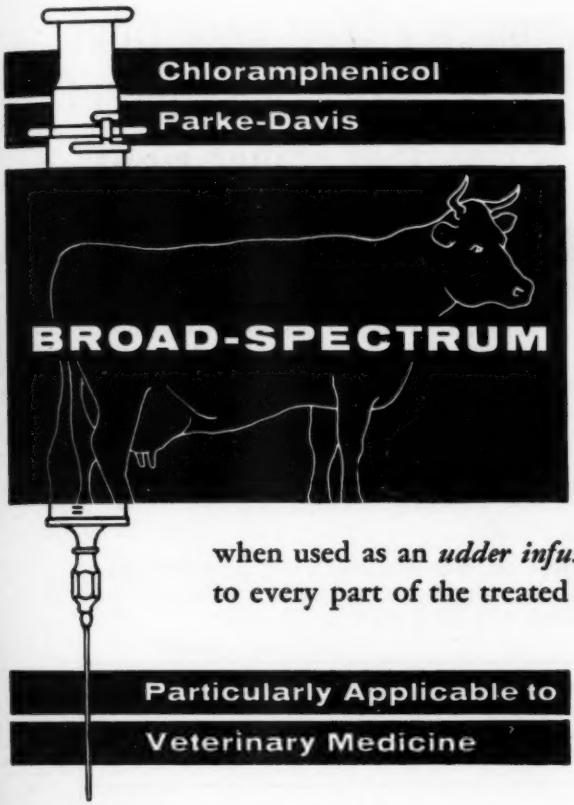

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when used as an *udder infusion* assures penetration to every part of the treated quarter

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to treat bovine ketosis, canine dermatoses, inflammatory joint conditions with a duration of action that's "just right"

Ultracortenol®

(prednisolone trimethylacetate CIBA)

ULTRACORTENOL is a new and improved glucocorticoid with distinct advantages over prednisone and prednisolone: the duration of therapeutic action is "just right" and therefore optimally effective. Hence, a single intramuscular injection generally achieves the desired effects, and daily injections or supportive oral therapy are not needed to maintain effective corticoid levels.

ULTRACORTENOL has been extensively tested and enthusiastically accepted by a number of small- and large-animal practitioners[1-10] who found these regimens to be highly effective:

Dairy Cow	Ketosis (acetonemia)	Single 100- to 200-mg. injection*
	Shock ("downer" cow) syndrome	Single 200-mg. injection as supportive therapy.
Dog	Dermatoses	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. For sustained therapy, repeat once or twice a week as indicated.
	Inflammatory joint conditions	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. Supportive oral therapy not necessary.

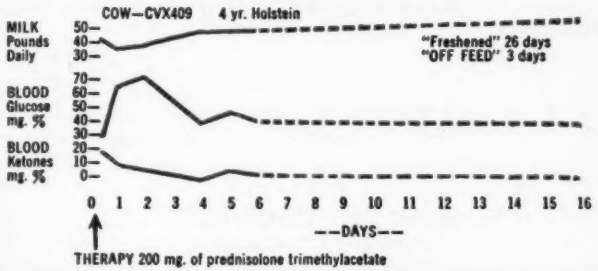
*This initial injection may be reduced to 50 to 100 mg. intramuscularly if simultaneous administration of intravenous glucose is given, thus permitting more economical glucocorticoid therapy. If necessary, either regimen may be augmented by an additional injection of 50 to 100 mg. Ultracortenol after 24 to 48 hours.

C I B A Effective Veterinary Drugs, Products of Exacting Research

New injectable glucocorticoid

BOVINE KETOSIS Following a single intramuscular injection of Ultracortenol, investigators observe that:

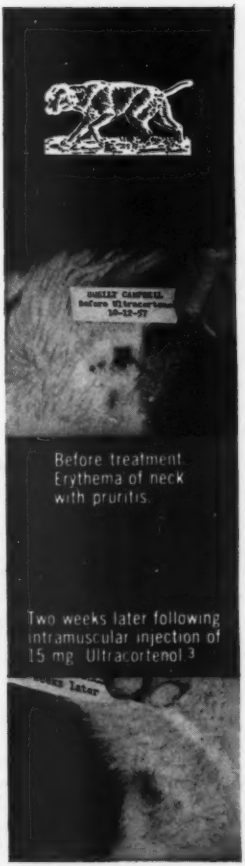
- appetite is restored, depression is dispelled within 12 to 24 hours[1]
- blood glucose levels are raised within 12 hours[1]
- blood ketone levels return to normal within 24 to 96 hours[1]
- a steady increase in milk production begins after 48 hours.[2]



This chart shows the good response in ketotic cow following intramuscular injection of 200 mg. of Ultracortenol.

(Adapted from Vigue[1])

CANINE DERMATOSES Reporting on 9 animals (of whom 6 received 15 or 20 mg. Ultracortenol in a **single** intramuscular dose), Pollock[3] says, ". . . Ultracorten Trimethylacetate [Ultracortenol] proved effective not only against the seemingly innocuous lesions, but also against the hemorrhagic dermatitis associated with exquisite pain." And, "The duration of the anti-inflammatory phase varies from seven to ten days depending upon the dosage. . . ."[3]


Before treatment. Erythema of neck with pruritis.
Two weeks later following intramuscular injection of 15 mg. Ultracortenol.3

References: 1. Vigue, R. F.: J.A.V.M.A. 133:326 (Sept. 15) 1958. 2. Shaw, J. C.: Personal communication. 3. Pollock, S.: To be published. 4. Rabin, P. H.: Personal communication. 5. Hoffer, S. H.: Personal communication. 6. Weir, H. T., and Hazelrig, J. W.: Personal communication. 7. Beck, J. W.: Personal communication. 8. Bull, W. S.: Personal communication. 9. Fessenden, P. E.: Personal communication. 10. Lohmeyer, C.: Personal communication.

SUPPLIED: Multiple-dose Vials, 10 ml., each ml. containing 10 mg. or 25 mg. of prednisolone trimethylacetate in suspension for injection.

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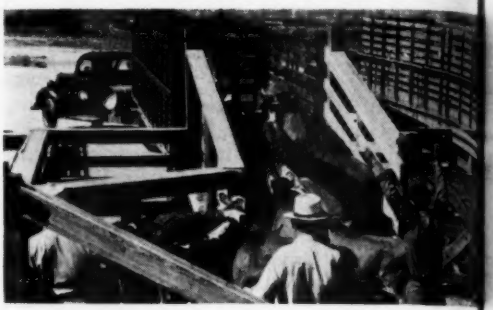
Cut weight loss in shipping cattle... *from range to feed lot*

Injection Sparine®

HYDROCHLORIDE

Promazine Hydrochloride, Wyeth

SPARINE has been established as the ataractic agent of choice in many areas of both large and small animal practice. It has long been used as preoperative medication, and it also facilitates branding, dehorning and castration. Recent tests have shown that SPARINE is indicated in yet another area of large animal practice. Given intramuscularly to cattle prior to shipment, SPARINE reduced markedly the weight losses caused by the rigors of shipping.



INJECTION SPARINE reduces weight losses by controlling the tension, nervousness and unruliness associated with handling, loading and shipping. SPARINE-treated cattle remained steady on their feet even in transit *without impairment of consciousness*.

The table below shows the results following the use of INJECTION SPARINE in reducing shipping-weight losses. In these studies, veterinarians supervised the truck shipment of 56 untreated and 261 SPARINE-treated animals from a range in Oklahoma to a Colorado feed lot—an 18-hour trip. Cattle were weighed immediately prior to shipment and immediately upon arrival at the feed lot. Veterinarians observed that the SPARINE-treated animals were easier to handle, and began to feed more readily because they settled down without milling, fence walking and bawling.

ANIMALS SHIPPED 18 HOURS BY TRUCK	No. of cattle	Av. wt. prior to shipping	Av. wt. upon arrival	Av. lbs. lost	% of shrink
Untreated	30	345.5	325.89	19.8	5.6
	26	434.7	405	29.6	6.89
Treated with SPARINE, ½ mgm. /lb. body weight	73	349.6	340.25	9.25	2.6
	39	350.05	340	10.1	2.9
	4	488.25	467.5	21.25	4.3
	27	464	448	15.7	3.4
	59	447.3	434	13.5	3.01
	59	446.65	433.3	13.3	3.04

AVAILABLE: INJECTION: 50 mg. per cc., vials of 10, 30 and 100 cc.

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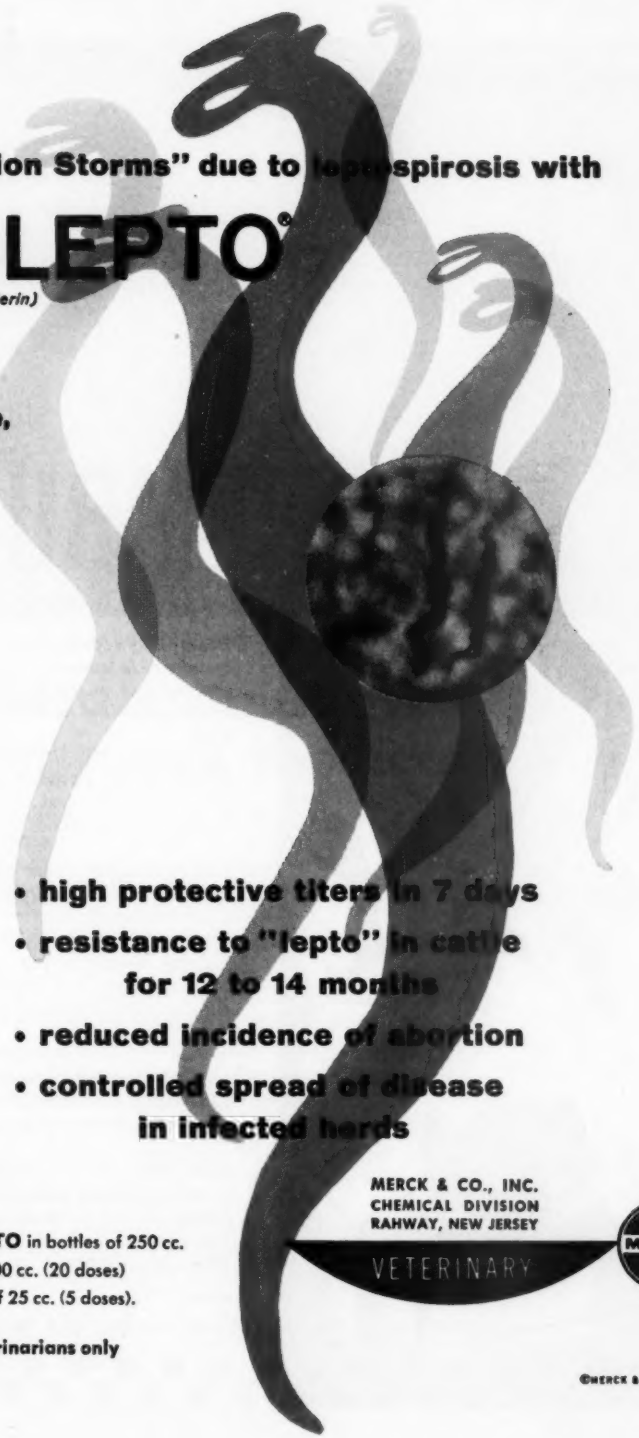

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2 PNEUMOCOCCI

3 STREPTOCOCCI

4 NEISSERIA

5 SHIGELLA

6 COLIFORMS

7 HEMOPHILUS

8 PROTEUS

9 PSEUDOMONAS

THE NINE ORGANISMS SHOWN AT THE LEFT ARE "ETIOLOGIC CULPRITS" OF BACTERIAL MASTITIS—THE ORGANISMS KNOWN TO CAUSE THIS DISEASE.

Neothion controls all 9 mastitis-causing bacteria

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Disposable plastic syringe permits you to instill Neothion with a single quick thrust of the thumb.

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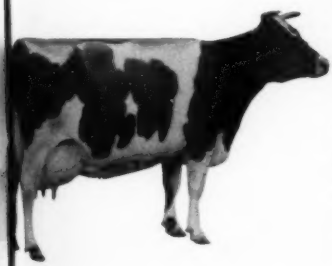
	GRAM POSITIVE BACTERIA			GRAM NEGATIVE BACTERIA					
	1 STAPHYLOCOCCI	2 PNEUMOCOCCI	3 STREPTOCOCCI	4 NEISSERIA	5 SHIGELLA	6 COLIFORMS	7 HEMOPHILUS	8 PROTEUS	9 PSEUDOMONAS
NEOTHION	■	■	■	■	■	■	■	■	■
Triple Sulfas	▒	■	■	■	■	■	■	■	
Penicillin	▒	■	■	■					
Streptomycin			■	■	■	■	■	■	
Neomycin	▒		■		■	■	■	■	■
Brand A BROAD SPECTRUM ANTIBIOTIC	▒	■	■	■	■	■	■	■	
Brand B BROAD SPECTRUM ANTIBIOTIC	▒	■	■	■	■	■	■	■	
Brand C BROAD SPECTRUM ANTIBIOTIC	▒	■	■	■	■	■	■	■	

■ Solid red squares indicate effective mastitis control. ▒ Light red squares indicate the widely demonstrated fact that staphylococci have built up a resistance to most antibiotics and sulfas now in use.



ONLY NEOTHION OFFERS YOU THIS "SOLID BAR" OF MASTITIS CONTROL

The chart above lists 9 organisms known to cause mastitis. Solid red squares indicate effective mastitis control. *Note that only Neothion is effective against all nine.*

Light red squares indicate the widely demonstrated fact that staphylococci have built up a resistance to most antibiotics and sulfas now in use. Staphylococci are among the chief causative agents of mastitis. *Note that only Neothion controls resistant strains of staphylococci.*

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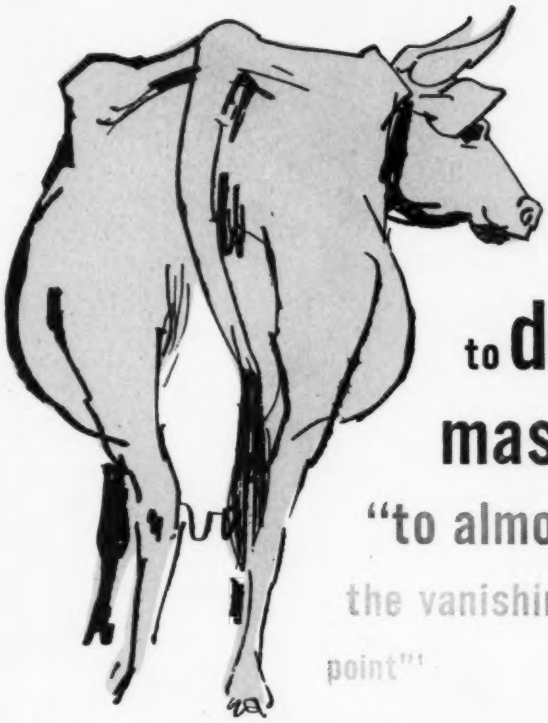

to decrease mastitis

"to almost the vanishing point"[1]

FURACIN®-PENICILLIN GEL *veterinary*

Furacin with penicillin produces an enhanced antibacterial action that is at least additive, and may be truly synergistic. The combination covers a broader bacterial spectrum of gram-positive and gram-negative organisms than either agent alone.

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1. Kakavas, J. C., et al.: J. Am. Vet. M. Ass. 119:203 (Sept.) 1951.

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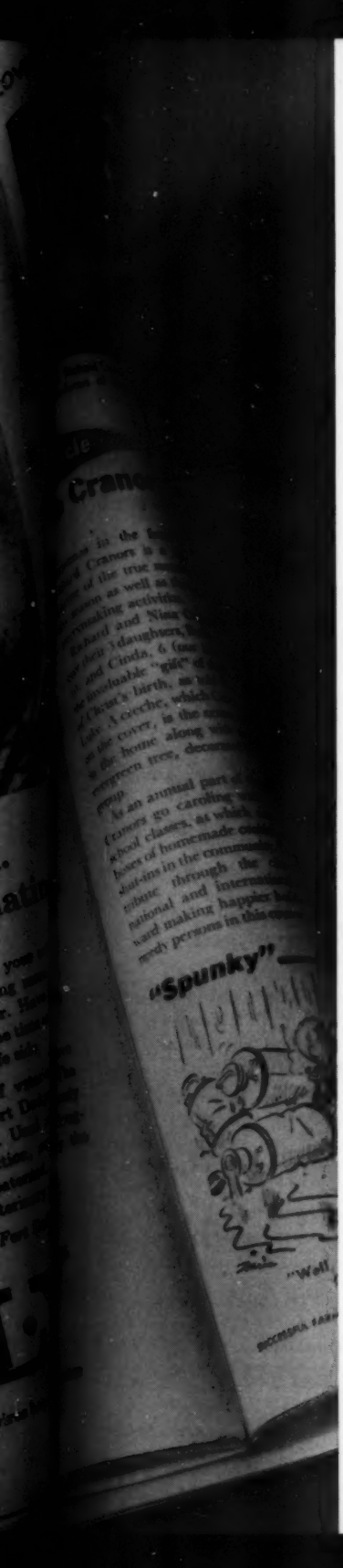

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tract

infection

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REFERENCES: 1. Mosier, J. E., and Coles, E. H.: Vet. Med. 53:649 (Dec.) 1958. 2. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 3. Mosier, J. E.: Vet. Med. 52:445 (Sept.) 1957.

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*Christian, A. B.: Antibiotic Stimulation of Milk Production. Vet. Med. 53: 632-34 (Dec.) 1958.

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News Comment

Auxiliary Heart

Functional capacity of the weakened heart can be augmented by adding muscle, according to Dr. Adrian Kantrowitz, speaking before the 44th clinical congress of the American College of Surgeons. The cardiovascular surgeon described an experimental procedure in which the left half of the diaphragm is wrapped around the aorta and, with the aid of a transistorized radio circuit, made to function as an "auxiliary heart." In dogs the relocated diaphragm has taken over 25% of the pumping load from the myocardium.

Pig Birth Weights

Weight of pigs at birth and the size of the litter are largely determined by the age of the gilt. This conclusion is based largely on a study of 34 sows and 46 gilts slaughtered and examined a week or two before their pigs were due. Sows had heavier pigs than gilts did, and older gilts had larger pigs than younger gilts. Study revealed that the weight of the gilt and the thickness of the fat back had no significant effect on the weight on pigs, but researchers point out that "older gilts are often heavier and fatter."

Brucellosis Organisms and Mastitis

Brucellosis can cause a severe but hidden type of udder damage resulting in lower milk production, according to tests by University of Wisconsin workers, Joseph Simon and D. T. Berman. Experiments last year confirmed earlier observations that lower milk production is one of the manifestations of brucellosis. Elimination of this damage is a result of the successful brucellosis eradication program.

Poultry Inspection

The new Poultry Products Inspection Act has been effective since January 1, 1959. It calls for inspection for wholesomeness by USDA inspectors of all ready-to-cook poultry shipped across state lines. Federal law requires

approval of plants, premises, blueprints, inspection labels, water and chemicals used by a processor.

Cognac-Fed Birds

A dry, roasted bird is a thing of the past in Argentina, according to a report in Turkey World. An hour before a bird is slaughtered, it is force-fed a tablespoonful of cognac. The bird relaxes and tensions disappear. Cognac adds a slightly extra zest to the flavor of the meat. Not only are flavor and texture of the bird improved, but it is also the humane thing to do, according to the Argentinians.

Dairy Cows Require Water

The average dairy cow drinks from 12 to 15 gallons of water a day, with high producers consuming as much as 40 gallons in a similar period. Temperature and amount of succulent feed in the ration are influencing factors. Free access to water may improve production from 3 to 4% over cows watered twice daily; 6 to 11% over cows watered but once daily.

Fly Maggot Control

Chemicals hold little promise in controlling fly breeding in manure, University of Wisconsin entomologists report, since insecticides have to establish contact with each maggot since they do not fumigate the manure pack. Maggots hatched after treatment are not killed by chemicals.

Fly control on farms will likely continue to depend on sanitation—manure removal before flies can breed. Chemical control in certain cases is possible, but manure removal is of signal importance.

Corneal Transplants

Research on preservation of corneas at the eye bank of the Washington Hospital Center has progressed beyond the experimental stage and actual transplants of glycerine-preserved corneal tissue are now being made. Dehydrated corneas have been preserved as long as two years in air-free, cigar-sized tubes in which air has been replaced with glycerine.

The dehydrated cornea absorbs the glycerine, remains in a state of suspended animation indefinitely, and is stored at room temperature until needed. Before transplanting, the cornea is removed from storage and washed in salt solution. This process draws the glycerine out of the tissue and permits the cornea to "rehydrate" to a normal state.

Better Pork Preservation

Feeding an antioxidant to pigs may make the pork keep better. West Virginia scientists report favorable results in feeding the same materials that are now added to lard to keep it from becoming rancid.

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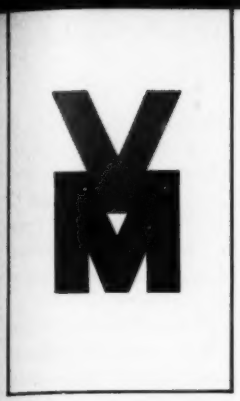

The potential destruction of clostridial produced toxins is well known to most practitioners. In the face of severe losses and a panicky client, the significance of the various types and appropriate therapeutic and preventive measures becomes vitally important. In this report the author, an established authority in this field, summarizes current knowledge and clearly defines practical application in conditions recognized in this country.

Clostridial Enterotoxemia

EARL BALDWIN, D.V.M.

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Cl. perfringens is an anaerobic spore former and as such is resistant to adverse environmental influence. The organism can live in soil and other materials for months if not years on end thus precluding the possibility of adequate disinfection. We have in our laboratory an old dried up culture that once contained media which has been kept at room temperature continuously for the last five years that contains living sporulated *Cl. perfringens.*

The organism lives as a saprophyte under normal conditions in the lower intestine of all domestic animals. These two points, sporulation and saprophytic existence add up to one conclusion: wherever a concentration of livestock exist or have existed within a reasonable period of time there also exists a large population of *Cl. perfringens.*

Under such circumstances, enterotoxemia is an ever present possibility. Although the *Cl. perfringens* normally found in the intestinal tract or in the ground are not toxin producers they are potentially so given the right circumstances in which to grow. This organism attacks carbohydrates and proteins with considerable vigor, breaking them down to various solid-gaseous component parts, many of which are toxic. It is only when certain conditions are met that the organisms produce their exotoxins. These conditions are easily met in the laboratory and consist briefly of providing anaerobic conditions, correct temperature and a media rich in proteins and carbohydrates. Under such conditions maximum growth may be obtained in four hours or less from the time a culture is inoculated. In the animal these conditions are created by a static condition of the bowel brought on by eating large quantities of highly nutritive feedstuffs rich in carbohydrates and proteins or by an abrupt change in diet. The static condition of the intestinal tract prevents flushing which normally eliminates the *Cl. perfringens* and rich feed creates the necessary media in which the bacteria can grow rapidly and produce toxin which is absorbed. The *Cl. perfringens* present must be of a toxogenic type.

At this time it is impossible to state why or how a toxogenic type originates: perhaps it is through serial animal passage or spontaneous generation. In the laboratory it is possible to create a highly toxogenic type from one which is a poor toxin producer and

it is also possible to change the toxin pattern of production by varying the media constituents.

Perfringens Type

Clostridium perfringens type A is found in the intestinal tract of practically all species of animals. Normally it exists as a saprophyte but under given conditions that are not completely understood it can produce toxins, the principal of which is identified by the Greek letter alpha. The type A organism has not proved to be of major veterinary importance in this country, although recent findings in California[1] have shown it to cause an enterotoxemia in lambs on Ladino clover pasture. In 1951 it was incriminated as the cause of losses in feeder lambs.[2] In England it has been isolated from calves that have died from enterotoxemia.

Cl. perfringens type B is sometimes identified as the lamb dysentery bacillus and is responsible for lamb dysentery in the British Isles. It has been isolated but once in this country in Wyoming[3] cattle. Under such conditions it cannot be considered of major economic importance in the United States.

The type B organisms produce two major toxins: beta and epsilon. Both are highly lethal. Actually the type B organism produces the same toxins as type C and type D combined for the major toxin of type C is beta and for type D is epsilon. This should be noted because of some confusion caused by naming *Cl. perfringens* types B, C, and D antitoxin and bacterin. This product contains only two major antitoxin fractions, beta and epsilon, and not the three major fractions that the label indicates.

Cl. perfringens type C is of economic importance in this country, causing hemorrhagic enterotoxemia or type C enterotoxemia as it is preferably called in suckling calves, suckling lambs, and pigs. Type C has also been found in feedlot enterotoxemia of cattle on a few occasions. In England it causes a disease termed "struck" in mature as well as immature sheep. Beta toxin is the major toxin produced.

Cl. perfringens type D was the first to be studied in detail in this country and is the cause of ovine enterotoxemia (pulpy kidney disease), or the so called over-eating disease. This latter term is highly undesirable and should not be used because of its far reaching connotation to sheep owners. Vaccination against over-eating disease has been interpreted to mean immunity against engorgement, impaction, water founder, bloat, and diarrhea due to over-eating on new pasture.

Ovine enterotoxemia is not confined to feeder lambs and may occur in suckling and

In western range areas, type C enterotoxemia frequently takes a heavy toll of the calf crop. Many western cattlemen now carry out annual vaccination of cows. In addition to control of acute losses, a dramatic drop in the incidence of chronic, debilitating diarrhea of calves is reported.

adult lambs as well. In addition to the disease in sheep the type D organism has been isolated[3] from calves and occasionally feeder cattle although the number of such cases is not large.

Hemorrhagic Enterotoxemia

Type C enterotoxemia or hemorrhagic enterotoxemia was first described in 1953.[4] It has been reported in most cattle raising areas of the United States. To date most studies have been confined to the disease as it occurs in suckling calves and lambs, although occasional reports have been made on the disease in older animals.

Generally the disease is observed in animals less than three weeks of age and ones which are large well formed vigorous animals. Dams are usually heavy milk producers and may be either heifers or mature cows. In western range areas there is commonly a sharp increase in incidence when a spring storm occurs. During such times the young animals and their mothers stay close together and the young nurse heavily, thus providing the opportunity for colic to occur.

Some variation in symptoms occurs, depending upon the severity of intoxication. Generally there is a period of listlessness and inappetance which may go unobserved in a large group of animals. This period occurs 12 to 24 hours prior to the onset of severe symptoms which are: acute colic as evidenced by uneasiness, straining to defecate, and kicking at the abdomen. Diarrhea may or may not occur depending upon the duration of illness. If the animal lives four or five hours after the onset of the acute attack there is a high probability that hemorrhagic diarrhea will start. Feces will contain large quantities of fresh undigested blood. Tetanic and toxic symptoms will be evident. Opisthotonus is frequently observed. Death occurs in from four to 24 hours.

Suckling lambs exhibit less dramatic symptoms: inappetance, shivering, bleating, colic; prostration and death are commonly observed. Occasionally a hemorrhagic diarrhea is observed.

These are seen in the acute form of the disease. Western cattlemen carrying out a vaccination program have consistently observed a dramatic drop in the incidence of chronic debilitating diarrhea in calves previously associated with stunting. This has led us to the assumption that a chronic form of enterotoxemia occurs and is responsible for loss of weight and condition. Serological studies[5] have substantiated this assumption.

Type C or hemorrhagic enterotoxemia in calves produces a dramatic hemorrhagic enteritis of the jejunum and ileum. The contents of the intestine consist of varying quantities of free blood and the mucosa is usually completely denuded.

Close up view of hemorrhagic enteritis (above) in a calf that died of type C enterotoxemia.

Pathology. Calves exhibit a dramatic hemorrhagic enteritis of the jejunum and

ileum. The contents of the intestine consist of varying quantities of free blood and the mucosa is usually completely denuded. Petechial and ecchymotic hemorrhages are regularly found on the epicardium and thymus and occasionally on other organs, the most frequent of which are the abomasum, diaphragm and pleura.

Lambs do not exhibit the dramatic lesions of the calf. The enteritis appears to be considerably less severe and only a small amount if any is found in the lumen. An excess of peritoneal fluid and hemorrhages on the heart and thymus are consistent findings.

Suckling Pigs. Enterotoxemia in suckling pigs is a problem in litters under four weeks of age and is characterized by sudden death. The lesions are similar to those occurring in suckling calves. It may be confused with TGE because of the high mortality and the not infrequent appearance of diarrhea. The distinguishing feature is that the disease generally affects only a few litters of the drove and is thus different than TGE.

Pulpy Kidney Disease

Type D enterotoxemia or pulpy kidney disease is largely confined to sheep. Occasional isolations have been made in cattle, but this is not a regular occurrence. Field reports of successful therapy and prophylaxis with specific biologics indicate that the occurrence of type D enterotoxemia in feeder cattle may be of more importance than the literature indicates.

The disease occurs in lambs of any age. In the case of suckling animals the disease is precipitated by the ingestion of milk. Ordinarily only single lambs are affected since they are exposed to a more abundant supply of milk than are twin lambs. The precipitating cause in older lambs is usually sudden exposure to lush pasture or range conditions.

In the feedlot the precipitating cause is the concentrated fattening ration.

Symptoms of this disease are nervousness, incoordination, circling, inappetance, prostration, opisthotonus twitching of the eyes and other central nervous symptoms and rapid death.

Pathology is marked by petechiae and ecchymosis which may but do not have to occur on any or all of the parenchymatous

Lambs dead of type C enterotoxemia do not exhibit the dramatic lesions of the calf. The enteritis appears to be less severe and only a small amount if any is found in the lumen.

organs. With but few exceptions hemorrhages are found on the endocardium. The intestine may show varying degrees of enteritis and the mesenteric vessels appear engorged. After an animal has been dead for a few hours the kidneys become pulpy, thus the name pulpy kidney disease. This lesion is not found in animals that have died very recently.

Control

We have available in this country effective prophylactic and therapeutic biologics. They are: *Cl. perfringens* type C, toxoid and antitoxin and *Cl. perfringens* type D bacterin, toxoid and antitoxin.

Cl. perfringens type C toxoid was designed for use in the cow and ewe during pregnancy.[5] Its effectiveness is totally determined by its toxoid content. It has been determined that 30 toxoid units per cc. is the minimum potency that will produce an adequate antitoxin response. The unitage is clearly stated on the label of some producers, and some producers have higher potency.

The first year, two injections of 5 cc. each for cows and 2½ cc. for ewes are required and in subsequent years a single "booster" injection is necessary. The first dose serves as a sensitizing injection and should be administered about the middle third of pregnancy. The second injection or booster should be administered during the last third of pregnancy at a time that the animals can

be handled safely without danger of mechanical abortion. Subsequent injections in succeeding years should be during the last third of pregnancy. The object of vaccinating close to pregnancy is to obtain as high an antitoxin titer as possible at the time of calving. The higher the blood antitoxin level at this time the higher the colostral antitoxin and thus the greater the protection afforded the calf.

The colostral antitoxin is accumulative within the calf. That is to say that in many instances we have found the antitoxin level of the calf exceeded the level of the dam.[5]

Cl. perfringens type C antitoxin is effective prophylactically, and if administered early in the course of the disease it is therapeutically effective. The following dosage comments are based on products containing a minimum of 1,500 units (Welcome) of beta antitoxin per cc. When faced with an outbreak in calves, antitoxin will stop further losses if administered to each calf the first day of life in a dose of 10 cc. Sick animals should receive 25 to 30 cc. intravenously to provide as rapid an attack as possible upon the toxin. The dosage for lambs is 3 cc. prophylactically and 5 to 7½ cc. therapeutically. For pigs the dose is 2 to 3 cc. prophylactically and 5 cc. therapeutically.

In the case of treating feeder cattle the dosage schedule is 10 to 20 cc. per 100 lb. of body weight administered intravenously if at all possible. This product is an equine serum and can produce shock. Epinephrine should be kept readily available.

The principal use of *Cl. perfringens* type D bacterin[6] and toxoid is in feeder sheep. To a limited degree they have been used in ewes to prevent losses in suckling lambs in the same manner as type C enterotoxemia. Vaccination should be performed at least ten days prior to exposure to the customary heavy fattening ration.

The principal use of *Cl. perfringens* type D antitoxin is to stop outbreaks of ovine enterotoxemia although it has therapeutic benefits if administered early in the course of the disease. The dose is 5 cc. prophylactically and 10 to 15 cc. therapeutically. The dosage schedule cited is based upon a product containing a minimum of 400 units U.S. of epsilon antitoxin per cc. You should know the potency of the product used.

Cl. perfringens type B, C, D antitoxin is a combination of type C and D antitoxin and does not contain three major fractions or antitoxins as the name implies.

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Preserving Gross Specimens

Glycerine is a component of a special solution used to preserve gross specimens in natural color. For years gross anatomical specimens have been preserved in formalin or alcohol, but specimens thus preserved decreased in value for biological studies after a few weeks because the color of the organ faded.

Researchers have now found that the new process, referred to as the Meiller antimony trioxide method, permits permanent and realistic fixation of color in preserved organs. The method involves fixation for a specified time in formalin, washing in clear water and short soak period in 2% ammonia. The preserving solution is prepared from decanted antimony trioxide solution, potassium acetate, glycerine and chloral hydrate.

Details are given in the Technical Bulletin of the Registry of Medical Technologists, pp. 167-70, for September 1958. Specimens preserved by this method were displayed at recent meetings of the International Academy of Pathology and the American Association of Pathologists and Bacteriologists.

CASE REPORT

Reducing an Equine Luxation

E. F. EBERT, D.V.M.

School of Veterinary Medicine
Columbia, Missouri

A 500 LB. THOROUGHBRED FILLY ten months of age was brought to the veterinary clinic on February 21, 1958. The filly had become frightened and had attempted to run through a board fence 12 hours previously.

Clinical examination revealed an injured left forelimb with a possible fracture and dislocation of the humero-radial articulation. A lateral view radiograph (fig. 1) showed an antero-dorsal luxation of the head of the radius and a separation of the ulna from the shaft of the radius.

FIGURE 1.

FIGURE 2.

Humero-radial luxations are rare in the equine species and no reports of an antero-dorsal luxation could be found.

The filly was given chloral hydrate (6%) intravenously, sufficient to produce sedation. She was then secured on the large animal table in lateral recumbency with the injured leg uppermost. Chloral hydrate infusion was continued until there was profound anesthesia.

An attempt to reduce the luxation with the aid of a "calf puller" was unsuccessful due to the muscular traction. In order to attain muscular relaxation, 5 cc. (120 units) of Tubocurarine chloride was injected slowly into the jugular vein. Again the attempted reduction failed, so an additional 2 cc. (20 units) of the curare like drug was given slowly. This time, with the aid of manipulation with the hands and a slight rotation of the leg, the bones slid back into place and luxation was reduced (fig. 2).

No cast or pins were used. The filly was placed in a well bedded stall and allowed to lie quietly for over an hour when she got to her feet with the assistance of a man at her tail.

After this she was able to get up and down without assistance. There was considerable swelling of the left elbow area for two weeks. Hot wet packs, applied twice daily, were used to reduce pain and swelling. The filly lost considerable weight even though her appetite and temperature remained normal. When discharged, six weeks later, she dragged the toe slightly and the triceps muscle atrophied, probably due to injury to a branch of the radial nerve during the luxation. However, the animal could walk and trot without limping and prognosis was favorable.

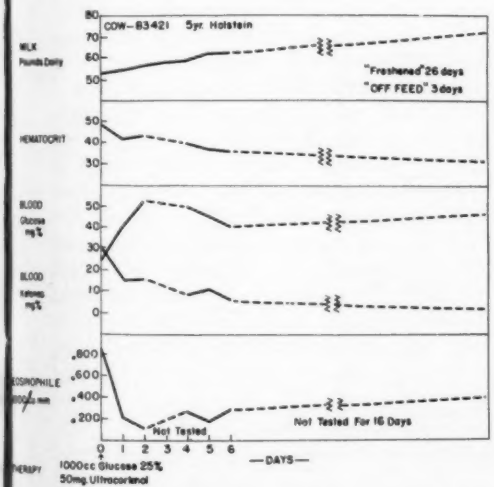
The first consideration in management of clinical ketosis is determination of cause of negative energy balance. The writers discuss discovery and correction of the primary offending condition as well as symptomatic therapy.

Management of Lactation Ketosis

R. F. VIGUE, D.V.M., W. H. FITZGERALD, B.S. and R. F. CASTRUCCI, B.S.

Department of Biochemistry
Nasson College
Springvale, Maine

FIGURE 1



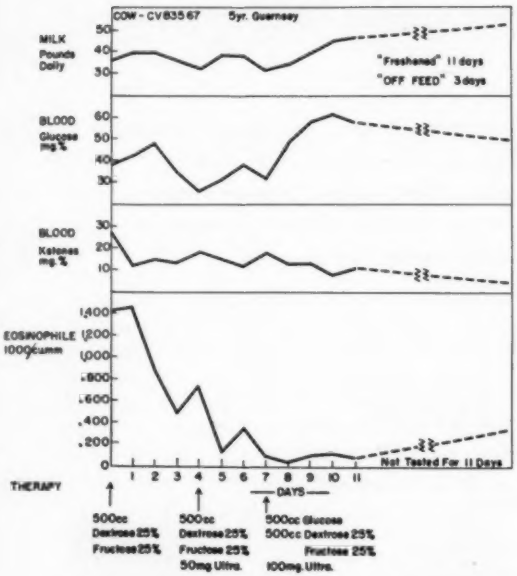
This shows temporary response to a single injection of carbohydrate in a badly depleted cow; temporary response to carbohydrate and 50 mg. Ultracortenol; and finally, recovery with combined carbohydrate and 100 mg. Ultracortenol.

BIOCHEMISTS have long recognized that excessive ketogenesis results from a deficiency of oxaloacetate at the Kreb's citric acid level. Since this deficiency can only result from a lack of glucose or glucogenic substances, ketosis must be considered a nutritional deficiency, regardless of the precipitating cause.

Deficiencies of glucose or glucogenic substances may result from a number of causes. Heavy lactation and pregnancy are physiological conditions which greatly increase nutritional requirements. Certain diseases characterized by inflammation, fever, infection, dehydration, etc., increase energy requirements. Other diseases characterized by imbalanced feeding, indigestion, bloat, toxemia, pain, trauma, visceral displacement, etc., not only cause inappetance but also depress digestive functions. Consequently an inadequate supply of nutrients is available for metabolic functions. All these conditions have a tendency to produce a negative energy balance.

Since excessive ketogenesis results from an insufficient amount of oxaloacetate which

FIGURE 2



This shows a good response to combined glucose and Ultracortenol therapy. Simultaneous administration of carbohydrate and steroid exerts a catabolic-sparing action. This allows utilization of the adrenocortical hormone for other beneficial pharmacological effects.

in turn is due to a shortage of glucose or glucogenic substances it is erroneous to classify ketosis as "primary" or "secondary." Ketosis is always secondary to some other condition which interferes with energy balance. Those who insist on making a disease of ketosis are making a disease out of a symptom. In the bovine, ketosis is not a metabolic disease *per se*. There is nothing wrong organically. Ketotic cows can utilize glucose and other glucogenic substances when they are provided.

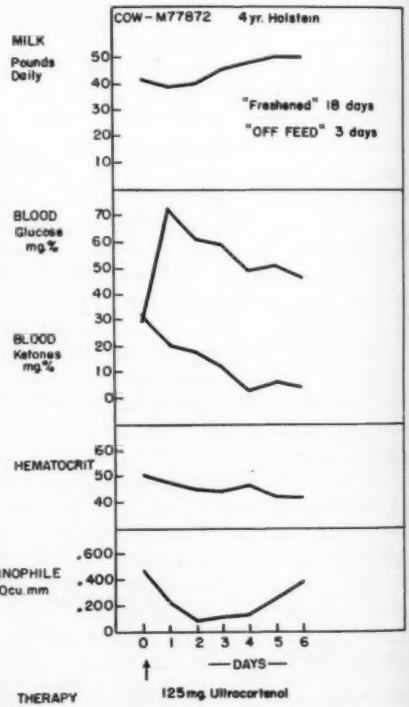
Therapeutic Considerations

The first consideration in the management of clinical ketosis is obviously to determine the cause of the negative energy balance. A sound working knowledge of the nutritional requirements of the modern dairy cow is essential for this important assessment. Unless the primary offending condition is uncovered and corrected, treatment of ketosis is tantamount to symptomatic therapy and relapses should be expected.

The second consideration is the correction of the ketosis complication. The clinician can choose from a number of treatments to accomplish this. The acute hypoglycemia can be corrected by supplying carbohydrate and other glucogenic substances intravenously. A single injection treatment is not always adequate, however. Glucose precursors can also be supplied orally in the form of sodium propionate, glycerine and other nutritional substances.

A time proved treatment consists of administering chloral hydrate. This compound probably slows down metabolic processes and thereby decreases energy requirements. Anabolic hormones such as testosterone increase protein metabolism and have been used successfully. Thyroxine, by stimulating all metabolic processes, is effective in mild cases. Certain vitamins have been shown to influence favorably specific enzyme systems concerned with carbohydrate

FIGURE 3



This shows a good response to 125 mg. Ultracortenol as the sole therapy in a Holstein cow with lactation ketosis.

metabolism and have been proved useful in the management of ketosis.

The most widely accepted means of treating hypoglycemia and ketonemia is through stimulation of gluconeogenesis by the use of adrenocortical steroids possessing carbohydrate activity (glucocorticoids). In addition to their carbohydrate activity, these steroids possess other desirable pharmacological effects which make them useful in the treatment of the ketosis complication. Beside inducing hyperglycemia, when administered in adequate amounts, the hormones produce hyperphagia, ruminal stimulation, normalization of electrolyte balance, rehydration and a general feeling of well-being. The glucocorticoids also supress inflammation, are useful in shock-like states and in severe systemic infections when combined with specific antibiotic therapy. In many instances steroid-therapy helps correct the primary disturbance as well as the associated ketosis.

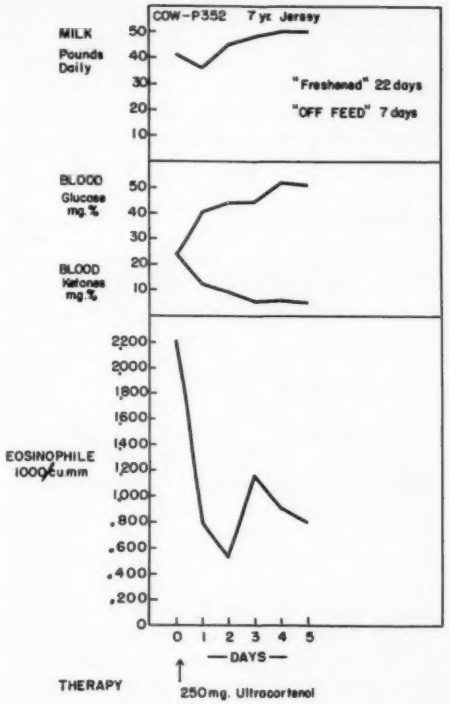
Experiences

In a previous publication[1] it was shown that a new ester of prednisolone [prednisolone trimethylacetate] (Ultracortenol — Ciba) appeared to possess certain advantages over other commonly used glucocorticoids in the treatment of ketosis. Since that report, 29 additional cases of lactation ketosis have been treated with the new steroid in doses varying from 50 to 250 mg. Because of its slow and prolonged action, the hyperglycemic effect can be extended as long as 96 hours by use of Ultracortenol. It has been our experience that with doses under 100 mg. the steroid is best administered in conjunction with conventional glucose therapy. This method of treatment has the added advantage of supplying a quick source of exogenous carbohydrate, sparing some of the catabolic effects of steroid therapy (fig. 1 and 2).

Indications of Ketosis

Generally speaking, when Ultracortenol is administered in amounts over 100 mg., gluconeogenesis is sufficiently rapid to reverse clinical as well as biochemical indications of ketosis within 72 to 96 hours (fig. 3 and 4). Milk production is usually depressed for approximately 24 hours following injection of the hormone. However, this can be avoided if other sources of glucose or glucose precursors are provided. While the optimal dose in this series was found to be 100 to 250 mg., an occasional cow may require larger amounts if no adjunctive therapy is provided.

FIGURE 4



This shows an excellent response to 250 mg. Ultracortenol as the sole therapy in a Jersey cow with lactation ketosis.

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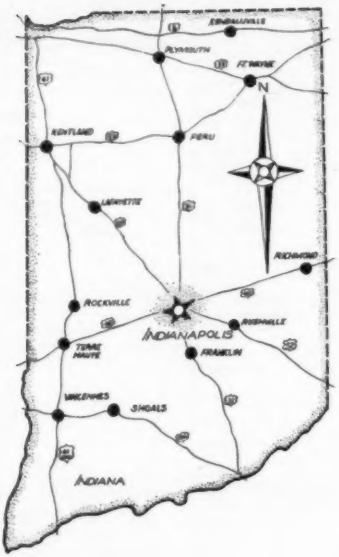

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75TH ANNUAL MEETING
January 14-16, 1959

The record of the Indiana Veterinary Medical Association and the profession in America is contemporaneous. Both took form during the turbulent '80s, when America was expanding with its new-found industrial prosperity. Both gathered speed as the science of a progressive era gained a toehold in the battle against entrenched ignorance and institutional intractability. Both have swept ahead to stellar accomplishments in the last decade or two.

The 75 year history of the Indiana group has encompassed most of the development of veterinary medicine in Indiana and the country as well. But a record that has been set is a matter of history as soon as it is accomplished. It becomes not only a goal to meet but a record to beat. Veterinarians have always used records as a starting to better and greater things. The first 75 years of the Indiana Veterinary Medical Association, passing in review like slides tumbling through a stereoscope, underscore the grand symphonic theme that will guide the group in years to come.

The first step on the long road through another 75 years was taken when a record crowd filled the Hotel Severin, January 14-16, 1959, to attend the 75th Annual Convention of the Indiana association. An outstanding technical program awaited the registrants, featuring an interesting array of nationally known speakers. This year all papers were accompanied by visual aids.

Early History

By long odds the greatest story to come out of the 75th Anniversary meeting recalled the long, bitter struggle of the profession from infancy to a position demanding professional recognition.

When the first meeting of the Indiana Veterinary Medical Association convened at Indianapolis in 1885, the federal Bureau of Animal Industry was less than a year old and all but unknown to livestock producers. Federal meat inspection remained five years in the future.

The subject most discussed at veterinary meetings and in the veterinary press during those formative years was veterinary legislation. A close rival for attention, an early association member has recalled, was education. Almost all practitioners regarded the courses of instruction then available in the best of the veterinary colleges as being inadequate; in the poorer schools and in the "diploma mills," courses were frauds. Chairs of veterinary science when first

established in Michigan, Ohio and Missouri were declared to be "empiric nurseries" by the editor of the *American Veterinary Review.*

Veterinarians who paved the way for the Indiana association correctly sensed the need for united action. With a tacit resolution — "there is no substitute for membership" — in mind, Indiana organizers built well. The association itself met in various cities and towns of the state until 1900, according to Dr. J. Leonard Axby, CVC '03, when the present form of the I.V.M.A. was achieved.

Speakers at early meetings were always members of the association. At no time was anyone out of state asked to participate during the formative years. At that time the principal activities of the veterinarian had to do with the horse and cow only. Commonly discussed in that era were topics such as azoturia, treatment of animals for nail pricks, and lameness in horses.

It was not until about 1910 that progress in cooperative efforts of the association and livestock groups was felt. Early county meetings in which the local practitioner took active part were the foundation of practices of livestock disease control.

Legislation slowly came into being in Indiana that restricted the practice of veterinary medicine to veterinarians largely as a result of association efforts. Grandfather clauses, however, protected empirics and quacks; elimination by attrition is not complete even in 1959.

As the association continued to grow, and gain a reputation for the technical excellence of its programs, VETERINARY MEDICINE carried the meetings beyond the confines of Indiana and I.V.M.A. meeting halls. Both Doctor Campbell and Doctor Anderes, as editors of VETERNARY MEDICINE, made it policy to place in the record of professional literature all reports that lent themselves to publication. For over a decade the codified record has added its accretion of professional knowledge each year.

The contrast between the old and the new is astounding. When early beginnings of the association are recalled, when meetings are remembered that dealt with nail pricks of horses, and contrasted with scientific discussions presented in 1959, one has a glimpse of progress beyond the wildest dreams of the founders.

Convention Highlights

The following highlights of the technical program will be supplemented by presentation of selected papers in future issues of VETERINARY MEDICINE.

Canine Distemper

Dr. R. V. Johnston, Pitman-Moore Co., presented evidence confirming the value of booster doses of canine distemper vaccine. A definite anamnestic response in immune animals has been established, particularly if they were previously immunized by vaccination and if the booster dose was given several months after primary immunization.

Further data demonstrate that passive protection can definitely be confined by hyperimmune serum or immune globulin against distemper, hepatitis, and leptospirosis and that active immunity can be established simultaneously by use of multiple doses of a combined inactivated vaccine.

New data show that modified live virus vaccine for distemper and hepatitis will induce antibody response in susceptible puppies or in those which are immune to one or both of the diseases.

A successful new puppy immunization schedule for badly contaminated distemper quarters was suggested which has been studied carefully in several kennels. It consists of six weekly doses of inactivated vaccine followed by a single dose of the modified living vaccine at about 12 weeks of age.

Watch for the complete presentation of this valuable distemper immunization information in VETERINARY MEDICINE soon.

Dermatitis

Dr. G. S. Trevino, Department of Veterinary Medicine and Surgery, School of Veterinary Medicine, Texas A & M, reported that demodectic mange responds quite satis-

factorily to his Texas Formula no. 2. This formulation consists of ET-57 (50% emulsion) 150 gm.; Dowcide, 25 gm.; propylene glycol, 2,000 ml.; iosopropyl alcohol, 400 ml.

This compound is applied with a brush twice weekly. In addition Fosteen baths are given twice weekly and the animal placed on a well balanced diet.

Cases of pyogenic dermatitis due to beta hemolytic streptococci were reported as difficult cases for treatment. Doctor Trevino reports best success when an antibiotic is selected by sensitivity tests. When possible he tries to use one that is non-absorbable unless bacteremia is a complicating problem.

It was pointed out that suitable restraint devices were essential to management of these lesions. He has found intravenous administration of proteolytic enzymes such as Tryptar and Varizyme valuable but always in conjunction with antibiotic therapy. Various therapeutic shampoos offer additional supportive therapy.

For the chronic undermining pyogenic dermatitis he recommends proteolytic enzymes, antibiotics and corticosteroids. For the case that does not respond to therapy he advised complete surgical removal of the lesion.

In management of ringworm, Doctor Trevino reports satisfactory results with Weladol, Cerbinol, Triocil or Fosteen baths. However, he cautioned that therapy is comparable to scalp infections in the human being and rapid response can not be expected. For deep fungus infections he has found Weladol and Fungizone give the best results.

For management of Collie nose, he recommends Atabrine, 50 mg. t.i.d. for an average sized dog plus corticoids administered topically and systemically. The animals must be kept out of the sun as much as possible.

If seborrhea is due to hypoproteinemia, prescription diet (p/d) and vitamin-mineral supplement is used. Thyroid extracts, small doses of estrogen, sodium thiosulfate orally or parenterally and the therapeutic shampoos such as Fosteen, Derisol, Seleen and Triocil are also used in management of seborrhea.

For ectoparasites, Doctor Trevino suggests malathion dips, 0.5% - 2.0%, diazinone dips, 0.25% and lindane dips, 0.45%.

Atrophic Rhinitis

Dr. William P. Switzer, Iowa State College Veterinary Medical Research Institute, reviewed the current knowledge of infectious atrophic rhinitis in swine. He emphasized that turbinate atrophy is a lesion that may be produced by different agents and that turbinate atrophy alone does not have too great an effect on rate of gain but may predispose to other respiratory infections. The single house isolation system of rearing litters is the most practical control measure at the present time. This authoritative review of a costly swine problem will be published in its entirety by VETERINARY MEDICINE.

The Mastitis Problem

Dr. John Herrick emphasized to Indiana practitioners that although there is need for more research in mastitis we can not wait to start control measures. Doctor Herrick pointed out that a key to success is recognition of the herd problem. With a basic program of testing individual quarters and antibiotic sensitivity testing, record maintenance, disposal of cows with permanently damaged udders, treatment of chronic infections, cow comfort in the barn and yards, clipping underlines and proper milking procedure, a major dent can be made in mastitis losses.

In Iowa, meetings with veterinarians, milk inspectors, milk plant operators and others interested in the problem have done much to stimulate recognition of mastitis control and create an increased demand for this type of veterinary service.

At least 80 Iowa veterinarians are now using laboratory technics to determine effectiveness of specific drugs in herd treatment for mastitis. A number of herds have been found resistant to drugs now on the market for mastitis control. The present program assures farmers that medicaments being used are actually effective in meeting the problem.

This report strikes to the core of factors that affect profit or loss in handling of feedlot cattle. In terms of everyday cow sense, the writer lays to rest the theoretical concept of stress as an explanation of all adverse circumstances, and presents practical pointers on feedlot problems.

Presented at the Midwest Veterinary Nutrition Conference, December 8-9, 1958, Kansas City, Missouri.

Combating Feedlot Stress Problems

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INTENSIVE CHANGES of management, nutritive levels and disease hazards usually accompany the changes from feedlot to market. At the present time these changes, particularly if they are adverse in any form, are called stress. The word stress is loosely used and is applied to any adverse circumstance affecting an organism—even emotional disturbances. In recent months a great play has been given various drugs for relieving stress, thus lulling feeders into the opinion that these adverse factors are packaged together and can be overcome together.

Feedlot Handling

There are many factors to be considered in handling a group of cattle coming into a feedlot. Too frequently the feeder thinks of the cattle that are "off" or ill as victims of the so called complex "shipping fever," and does not consider the predisposing factors attributing to general weakness. Some factors to consider are:

1. Age of Cattle. In general younger cattle are more susceptible to more diseases than are older cattle. This is particularly true of internal parasitism. In many areas internal parasitism is a great problem; however not all feeder cattle are wormy. Promiscuous worming is unnecessary. Fecal examinations should be conducted before worming takes place.

2. Nutritive Level. Cattle originate in some areas where their greatest affliction is "hollow belly." Mineral and vitamin deficiencies are not uncommon but frequently the amount of T.D.N. is low. There is more and more thought that cattle coming into the feedlots should be supplemented with a concentrated highly fortified feed that is compatible with existing ruminal flora. In other words a "transfusion effect" for those deficient in nutrients is seemingly indicated. This involves skill in feeding by the feeder.

3. Handling. Calves that are weaned and moved are naturally emotionally disturbed. This, coupled with a change and a deficiency of feed and water creates stress on the animals to the point that they are badly dehydrated and are easy prey for "opportunist" organisms that are commonly around, yet produce disease only when the animals are in a weakened condition. Animals of any age that are moved great distances with rough handling, change of feed and water and fright from strange surroundings are

under stress. Thus cattle that are moved direct from range to feedlot may escape many of the factors that create illness when they enter the feed lot.

4. Shipping Fever Complex. Through the years various preventives have been tried prior to the time the cattle were moved from range to sale barn or commission firm. Bacterins, serum and antibiotics have been used with varying degrees of success.

One of the most interesting thoughts on this overall problem is that the trigger mechanism of shipping fever is a virus. There is ample evidence of this. It is not definitely known, but where cattle have been vaccinated for infectious rhinotrochititis, shipping fever has been reduced as high as 60% in one large feedlot. Therefore, there exists the possibility that some of the viruses capable of producing respiratory infections in cattle may be the trigger mechanisms of shipping fever, as we know shipping fever today. Actually we have probably been treating secondary infections instead of the "trigger mechanisms."

5. Foot Rot. Feeders claim that foot rot is their number one problem. Cultures of infected feet have revealed as many different organisms as cattle infected. The disease also varies from feedlot to feedlot. In some areas the soft part of the hoof head may be affected with an apparent fungus infection whereas in other feedlots it may be the ventral portion of the claw affected and is usually associated with a foul smell, thus *Spherophorus necropherous* has been incriminated. In some feedlots antibiotics give good response while in other lots, they appear to be of little value.

Modern Feedlot Technic

It is still bewildering to observe a feeder with an investment from a few thousand to several hundred thousand dollars in cattle throw them into lots that are a sea of mud, filth, stones, and debris. The mere thought of footrot control is important enough, but think of the effect on weight gain and feed utilization these adverse conditions produce.

In general, foot rot may be intensified by the existence of a vitamin A deficiency and a mineral deficiency. The addition of 2% steamed bone meal to the grain mix plus vitamin A supplementation has been of great aid in preventing foot rot. However there still will not be a feed additive that will overcome faulty management.

6. Tranquilizers. The innovation of a drug that calms an animal doing away with their fears and wild actions has been a great boon. In other words they aid in preventing stress. The average shrink on a feeder animal from its origin to its destination amounts to 3 to 10%. This is a great economical loss to the feeder. Tranquilized animals have been observed to shrink only one-half this amount. Here is where veterinarians can be of great service to the cattle industry by acquainting prospective feeders on handling their cattle before they buy them. However, the use of these drugs for animals going to market is of questionable value. Packers have found that they have had to trim the area where the tranquilizers were injected.

7. Restraint. A veterinarian in a large cattle feeding area was heard to say that more cattle are affected by rough handling than by disease itself. He also stated that if cattle breaking with shipping fever were immediately and properly treated the weight loss and mortality loss would be cut to a minimum. It is imperative then that the industry, veterinarians, etc., make a concerted effort to aid and encourage the feeder to build proper restraint—runs and squeeze chutes—so that the cattle can be handled with a minimum of effort and maximum safety. Keeping cattle in a sea of mud enclosed by one barb wire strand is not conducive to longevity for either the veterinarian or the afflicted cattle.

8. Common Sense. Some feeders never have cow sense. The feeder that manhandles a group of green, yard weary cattle the minute they hit his premises is in for trouble. He wants to vaccinate them for something, worm them and spray them and have them eat 20 pounds of succulent green alfalfa and ten pounds of shelled corn all the first day. The feeder that makes his cattle comfortable, allows them to rest, provides ample water and watering space and starts them out slowly on feed, can have the shrink replaced and on full feed in a matter of days. He has cow sense.

It appears therefore that the following facts briefly summarized are needed to be employed to avoid stress on cattle coming into the feed lot.

1. Cattle that move from sale barn to sale barn not only are exposed to various diseases, but have suffered considerable stress from lack of water, feed and rest. Therefore an attempt should be made to avoid "yard weary" cattle. Direct from the range or commission yard or barn to the feedlot is the best preventive of "shipping fever" complex known.

2. Tranquilization of feeder animals aids in preventing shrink. The drug enables cattle to be placed on full feed in a shorter time than non-tranquilized animals.

3. Shipping fever apparently is triggered by a virus and accentuated by bacteria. Respiratory infections should be attended to immediately before weight loss is suffered. Antibiotics in the feed are of little value for the animal that is so sick that it cannot eat or drink. Possibly in the future preventives in the form of vaccine will aid in preventing shipping fever.

4. Fortified rations for nutrient deficient cattle are important if the normal ruminal flora can handle such concentrated rations. Prairie hay and a handful of oats do not readily restore shrink and have the animal gaining. On the other hand, alfalfa hay and corn self fed the first day will invariably result in a sick animal.

5. Keep the animals comfortable. Handling animals to give them all the necessary "shots" is sometimes more detrimental than the illness that might occur. A properly built corral and squeeze chute is a must in handling cattle. It is uncomprehensible why a feeder will borrow several thousand dollars to buy 25 to 30 cent cattle and then bring them home and put them in a sea of mud and expect them to gain three pounds a day on the best of feed.

It still is the masters eye that fattens cattle, not a push button machine and mechanical gadgets.

Milk Fever Treatments

Not so many years ago, milk fever occurred frequently and was usually fatal. Then, in 1897, Dr. J. Schmidt of Kolding, Denmark, tried intramammary infusion of potassium iodide. He had remarkable success. His treatment "must be considered one of the most important achievements of modern veterinary science. It has proved a 'boon and a blessing' to the cattle industry of the world and will remain a lasting monument to his name and fame."[1]

Eventually, experience demonstrated that inflation of the udder with oxygen gave even better results. Kunsel first reported this in March, 1903, and his method was referred to as "Kunsel's Milk Fever Treatment." This procedure consisted of inflating the udder to tenseness with oxygen from a cylinder, then ligating the teat. Using a bicycle-pump or a small rubber bulb, gave just as good therapeutic effect. The "air treatment" was the therapy of choice for many years.—*Kenneth B. Haas, D.V.M.*

1. Alexander, A. S., Udder Diseases of the Cow and Related Subjects, Richard G. Badger, Boston, 1928, p. 81.

Domestic Fowl

The chapter on the fowl in *The Care and Breeding of Laboratory Animals* is written by F. B. Hutt, Department of Poultry Husbandry, Cornell University; it does not differ materially from the teachings of other scientific works on poultry husbandry and poultry pathology with which readers of this journal are already familiar.

The prominent part chicken embryos have had in recent years in modification of certain bacteria and viruses and in the manufacture of vaccines from both types of organisms may have given some readers the impression that the use of the fowl as a laboratory animal began recently. The author denies this at the outset. He writes: "For centuries the favorite source material for embryologists, they [fowl] have, in more recent times, proven ideal for various studies in endocrinology, genetics, immunology, and certain fields of physiology."

*The Care and Breeding of Laboratory Animals, edited by Edmond J. Farris. John Wiley & Sons, Inc., New York, New York.

CLINICAL REPORT

Evaluation of a New Antibiotic

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MAMMARY INFECTIONS in the bovine and respiratory infections in most other species have been major problems for the veterinary practitioner. Although literature dealing with these infections has been voluminous, economic losses have continued to grow, seemingly in direct proportion to the increase in livestock numbers.

In recent years, much interest has been evoked by new antibiotics, but most in turn differed only slightly from their predecessors and offered only limited advantages. As a result, many veterinarians view the announcements of new but closely related antibiotics with increasing skepticism.

Recently a product containing diethylaminoethylesterpenicillinhydriodide, an antibiotic which exhibits specific affinity for respiratory and mammary tissue, in combination with dihydrostreptomycin (Iomycin — Norden; and Havlomycin — Haver-Lockhart) was introduced. An attempt to evaluate the effectiveness of this product in domestic animals forms the basis of this report.

Diethylaminoethylesterpenicillinhydriodide was first developed in Europe between 1948 and 1951, and was subjected to extensive experimental work and clinical field tests in human and veterinary medicine. European research workers in 1951 reported effective levels of the antibiotic in the sputum of patients following treatment. Others verified this observation and further demonstrated that the antibiotic has a special affinity for pulmonary, bronchial and mammary tissues. Because of this special affinity, levels of Iomycin in respiratory and mammary tissues are two to five times higher than those obtained from a comparable dose of procaine penicillin G. In general, Iomycin exhibits the same low level of toxicity, as expected from the intramuscular injection of an equal quantity of procaine penicillin and dihydrostreptomycin combination.

Case Reports

Case No. 1. Pneumonia was diagnosed in four goats at a goat dairy. Temperatures were: goat no. 1, 105 F.; no. 2, 103.5 F.; no. 3, 103 F.; and no. 4, 103 F. Each was off feed, exhibited rales and dyspnea. Goat no. 1 was acutely ill, and death seemed imminent. The owner, who had previous experience with pneumonia in goats, believed that all would die. Each goat received 2 cc. Iomycin intramuscularly daily until completely recovered. No other medication was administered. The goats recovered in 6, 5, 2, and 2 days respectively with daily response and improvement in appetite and production.

Case No. 2. Acute pneumonia was diagnosed in five dairy cows. Two cows received 10 cc. Iomycin administered intramuscularly daily for two days, and three cows received a 10 cc. dose daily for three days. The treatment was followed by uneventful recovery.

Case No. 3. Pneumonia was diagnosed in three rabbits. The rabbits exhibited dyspnea with rapid breathing, and crepitation could be heard over each lung. Iomycin (1 cc.) was administered daily for four days. Each rabbit recovered.

Case No. 4. A pet Holstein steer weighing 500 lb. had exhibited dyspnea with a nasal discharge and a cough for a month. The owner had given several injections of penicillin, but the condition remained unchanged. When examined, the steer ex-

hibited a typical case of "foreign body." The steer was given 10 cc. Iomycin intramuscularly and three vials were dispensed. Clinically, the steer was normal when the fourth vial of Iomycin was used, but the owner gave an additional three vials because this was no ordinary steer. It was his pet.

Case No. 5. A purebred Jersey cow has upon five occasions since December 1, 1957, exhibited symptoms of pneumonia with a temperature of 104 to 105 F. The animal went off feed and production when sick. An injection of 10 cc. Iomycin reduced the fever and caused the crepitation and rales to disappear in each case. After a second injection, the cow remained well for a varying period. However, since the animal has had five attacks, the writer believes the animal will die of a similar condition in the near future. An autopsy at that time will probably reveal the complete story.

Case No. 6. Two days after freshening, all four quarters of a Holstein, ten years of age, were swollen and congested. The cow had a serous-like fluid discharge from each quarter, was off feed and exhibited a temperature of 106 F. Iomycin (10 cc) was administered intramuscularly, with instructions to the owner to milk the animal as often as possible. The next day the temperature was 103 F., and some improvement was noted both in the milk and the cow's appetite. A second 10 cc. dose of the antibiotic was administered and frequent milkings were continued. On the third day of treatment, temperature was 101 F., with appetite and milk appearing normal. The owner was advised to continue to milk the cow for the current lactation period and then dispose of the animal because of advanced age and a pendulous udder.

Case No. 7. Severe chronic mastitis was diagnosed in ten cows on one dairy farm. At least one and sometimes all four quarters were affected in each cow. Two animals were down. All affected quarters were drained by amputation of the teat and each cow was treated with 10 cc. Iomycin and 10 cc. of a mastitis bacterin (Coli-stophstrep Bacterin — Norden). The next day one of the downer cows was dead, whereas the other was up and grazing. The remaining eight cows regained their appetite. It is not known whether treatment with the antibiotic stepped up recovery in these cases because drainage alone will usually bring desired results.

Case No. 8. Iomycin was used on five cases diagnosed clinically as early canine distemper. At the time of initial treatment, four dogs exhibited temperatures of 106, 103, 104, and 103.6 F. These dogs were each treated with one 75 mg. of modified live virus distemper vaccine administered intravenously with 1 cc. of Iomycin administered intramuscularly daily until recovery. Each dog received vitamins and tonic tablets. The fifth dog had a well developed case of pneumonia with swollen glands under the jaw complicating the distemper. Triple sulfa was also used in this case. All dogs made a speedy recovery. Iomycin may prove to be valuable in distemper treatment. More study is needed, however.

Case No. 9. Three Beagle pups, three months of age, all past the viral stage of distemper and infected with hookworms, were treated with five daily injections of Iomycin (1 cc.) and wormed at regular intervals until negative on fecal examination. One dog died about a week after the last injection of Iomycin. Recovery was uneventful in the other two.

Case No. 10. An undersized grade Hereford from the stockyards was presented for treatment. This heifer was bred too young and a calf was taken while the animal was still in the yards. The cow was put on good pasture and was fed well, but did not give enough milk for the calf. Thirteen days after freshening the heifer refused food and exhibited a temperature of 104.6 F. Diagnosis was metritis complicated by pneumonia. The cow was treated with two uterine bolets and a vial of Iomycin. Norgadine powder was added to feed. Temperature was 104.4 F. the following day. Subsequent therapy consisted of ½ vial Iomycin b.i.d. After three days temperature was 102.6 F., and another ½ vial of Iomycin b.i.d. was prescribed. Subsequent treatment consisted only of Norgadine powder added to the feed. After five days of coughing, an uneventful recovery was made.

Case No. 11. Sixteen days after the purchase of an emaciated heifer and calf, the calf refused to eat and exhibited a tempera-

ture of 104.4 F. A diagnosis of pneumonia was made. At the time of purchase, this heifer was in such poor condition it did not have enough milk for the calf. Both cow and calf were hand fed, and both were beginning to pick up weight. Iomycin (2 cc.) was administered to the calf the morning when presented and 1 cc. that evening. The next day the temperature was still 104.4 F., but the calf appeared to be feeling better and appetite was improved. A 2 cc. injection was administered that morning and evening. Still more improvement was noted the third day, and the temperature was 102.5 F. No more medication was given. After three more days of coughing, the calf made an uneventful recovery.

Summary

After reviewing the cases recorded above, the writers are of the opinion that the antibiotic is of value in selected cases. In evaluating this new product, it was first used rather promiscuously. Used in this manner it was no better than ordinary penicillin. In selected cases, however, when a definite need of a heavy concentration was indicated, it produced results. Ordinarily poor results follow poor clinical judgment; however, the law of averages at times allows good results even with poor judgment. This is not always the case with selective drugs. The use of selective drugs demands quick and thorough thinking on the part of the clinician. Only then are they valuable.

Toxicity of Seed Protectants

Toxicity of organic seed protectants for poultry was discussed by the writer in VETERINARY MEDICINE (50:426, [Sept.], 1955). The fact that surplus seed corn which has been treated with pesticides finds its way in limited quantities into poultry feeds gives this subject continued interest to the veterinarian. Of a number of compounds used for protection of seeds against fungi, tetramethylthiuram disulfide (TMTD) (Arasan) seems to be the one most likely to cause deleterious effect on birds if treated grain finds its way into poultry rations. (Heuser, *Poultry Science* 35:160, 1956; Swanson et. al., *Poultry Science* 35:92, 1956; and Waibel et. al., *Poultry Science* 36:697, 1957). Link, Smith and Morrill (Univ. Illinois, Agric. Exp. Sta. Mimeo Rept., 1958) found that another protectant, N-trichloromethylthio - tetrahydrophtholmide (Captan) had little if any deleterious effect on either chickens or pigs if used in recommended quantities in rations.

Waibel et. al. found that chicks and goslings were sensitive to poisoning by TMTD (Arasan) but turkey poults were fairly resistant. Chicks showed toxic signs when fed 40 ppm; goslings, when fed between 40 and 150 ppm while poults could apparently tolerate 200 ppm of the nocuous component. The symptoms seen by Waibel et. al. in all three species involved leg deformities and loss in weight. Chicks showed a characteristic leg weakness which involved sitting on the hocks, crooked and curled toes, enlarged hocks, slipped tendons and spraddle legs.

In adult chickens, almost immediate drop in egg production follows feeding of TMTD treated corn. Swanson et. al. found that low levels (10-50 ppm) resulted in a reduction of shell thickness and albumin firmness of eggs laid. Many eggs were misshaped, and some were laid prematurely with little or no shell deposit. When levels above 100 ppm were fed only soft shell eggs were laid. Since drop in egg production, premature expulsion of soft shelled eggs and misshaped eggs are commonly associated with such infectious diseases as Newcastle disease, infectious bronchitis, and avian mononucleosis, as well as with the feeding of many drugs and especially certain of the sulfonamides, these must be eliminated in making a diagnosis.

Since seed corn treated with Arsan contains about 630 ppm it is dangerous to feed such corn to poultry even as a small percentage of the ration. Treated corn looks similar to untreated so examination of the ration normally would not aid in determining the presence of toxic grains. A careful survey to determine if treated seed corn has been used should be made in all suspected cases of poisoning.—*W. R. Hinshaw, D.V.M.*

Practitioner's Laboratory

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Examination of Ascitic Fluid

The causes of ascites are many and varied. The problem facing the practitioner is simply this: What is the cause of the condition in a given animal and, of course, what he can do about it. An article of this nature is primarily concerned with the first factor.

Ascitic fluids are divided into the general classifications of exudates, resulting from inflammatory reactions, or transudates, resulting usually from impaired hepatic, renal or cardiac function. Other causes of transudates include neoplasms, severe parasitism, starvation, etc.

Obtaining the Specimen

Strict aseptic technic must be followed in obtaining the specimen of ascitic fluid. Serious harm can be done to the patient by infecting a transudate or by introducing additional types of organisms into an exudate.

Care should be taken to prevent puncture of the bladder in obtaining the specimen. If preferred, the bladder can be emptied naturally or by catheterization prior to paracentesis. Complete removal of the ascitic fluid is of questionable value unless extreme dyspnea exists. The cavity usually refills promptly and the withdrawal results in serious loss of body proteins and electrolytes. Ascitic fluids are dynamic, 40 to 80% of the fluid and many components being removed and replaced hourly.

Laboratory Methods

Routine examinations readily performed in the practitioner's laboratory include the following: specific gravity determination,

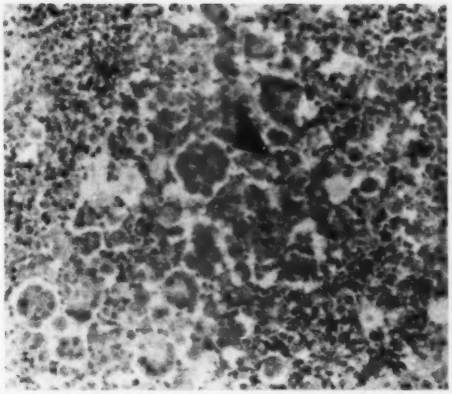


Fig. 1. Sediment from ascitic fluid. Large tumor cells (see arrow) tending to form granular structures (adenocarcinoma), mesothelial cells and leukocytes. (100 X.)

observation of character and color of fluid, determination of albumin content, culture and antibiotic sensitivity test (if septic), preparation and examination of a Wright's stained smear, examination of a wet preparation of the fluid microscopically and a test for bile, if indicated.

It is recommended that tubes of three 5 cc. quantities be obtained. One of these is formalinized by adding 0.5 ml. of formalin (40% formaldehyde) to the specimen. One specimen is oxalated to prevent possible coagulation and one specimen is collected "as is," kept free of external contamination and used for culture.

Specific Gravity

The specific gravity is obtained with a urinometer.* The difference between an exudate resulting from an inflammatory reaction or a transudate resulting from transfer of fluids across semipermeable membranes can be made on the basis of the specific gravity. The dividing line is 1.017. Fluids with a value below that figure are usually transudates, whereas the higher albumin content of exudates causes them to be above 1.017 specific gravity.

Character

The color, clarity or turbidity of the fluid is noted. Bile stained fluids usually

*Available from laboratory supply houses as A. H. Thomas Cat. #3517, about $3.00. Philadelphia 5, Penna.

indicate some disturbance of the liver or gall bladder. Most ascitic fluid is straw colored. Turbid fluids usually indicate the presence of many cells and are usually characteristic of inflammatory reactions or neoplasms. The presence or absence of blood or hemoglobin is noted.

Albumin Content

This determination helps to ascertain or confirm the diagnosis of exudate *vs.* transudate. Exudates usually have 4 to 6% or more of protein (mostly albumin) whereas transudates usually contain from 1 to 3% or less. This can be ascertained by the use of Esbach's albuminometer. The albuminometer consists of a graduated tube that is filled to the marks with the specimen being tested (ascitic fluid or urine) and Esbach's reagent (picric acid 1 gm., citric acid 2 gm., distilled water q.s. 100 cc.). Albuminometers are available from laboratory supply houses. For convenience one is quoted — A. H. Thomas Co., Philadelphia 5, Penn., Cat. #3500, price about $3.00. The reading is made in 24 hours.

Bile

The test for bile can be made with Ames Laboratories' Ictotest Tablets.

Microscopic Examination

A drop of the fluid is placed on a clean microscope slide and a smear made exactly as if the material being examined was blood. This is stained with Wright's stain and the cells examined. In inflammatory reactions (exudates), many leukocytes and mesothelial cells (from lining of abdominal cavity) will be observed. In cases of cancer, the abnormal cell forms will be evident (fig. 1). If the latter is suspected, it would probably be wise to send the formalinized specimen to a laboratory for sectioning and histopathological examination. This formalinized fluid is centrifuged and allowed to fix overnight. The pellicle in the bottom of the tube (or the tube and contents) are sent to the diagnostic laboratory for sectioning.

Culture

The specimen collected in an aseptic manner can be cultured in broth or transferred directly to a blood agar plate and an antibiotic sensitivity test run. This will, of course, be of value in the case of exudates. The Wright's stain referred to above will reveal the morphology of the bacteria if present.

Interpretation

If the results of the above tests indicate that the fluid is a transudate (specific gravity below 1.017 and protein content below 3%), the cause should be suspected to be hepatic, renal, cardiac or the result of starvation or severe parasitism, among other things. Exudates will be characterized by a fluid made turbid by leukocytes, erythrocytes and other cellular exudates. The cause of the peritonitis is then sought. The microscopic examination aids in confirming the nature of exudates.

Milk Sickness

"Milk Sickness" or trematol poisoning of man is a toxemia resulting from drinking the milk or eating the milk products from cattle with "trembles." The sickness was particularly prevalent in pre-revolutionary North Carolina, where it was a great threat to early American pioneers.

One writer has estimated that one-half the human deaths in Dubois County, Indiana, in 1815 were due to milk sickness. Abraham Lincoln's mother died of it in 1817, and so did the mother of Governor C. S. Osborn of Michigan.

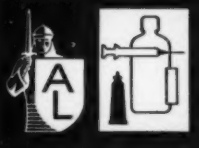
Even today, milk sickness has not entirely ceased to be a menace to human beings and animals. The disease is now confined to the white snakeroot (boneset richweed) areas of the eastern Mississippi Valley, and the rayless goldenrod (jimmyweed) areas of southern Colorado through Arizona to New Mexico, to the Texas Panhandle.—*Kenneth B. Haas, D.V.M.*

SMALL ANIMAL PRACTICE

VIROVAX D-H*

[PATENT PENDING]

DISTEMPER and HEPATITIS



ALLIED LABORATORIES, INC.

The professional responsibility of the veterinarian in discouraging use of dogs affected with or carriers of hip dysplasia for breeding purposes is at once apparent in this report. Here the writer presents a searching analysis of the problem in canine genetics with special attention to mode of transmission. Technic for diagnosis is also discussed.

Congenital Hip Dysplasia in Dogs

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HIP DYSPLASIA IS A MALFORMATION OF THE BALL AND SOCKET joint of the hip. In a normal hip, the acetabulum represents a section of a hollow sphere which holds a perfectly round femoral head. In hip dysplasia, the socket deviates from its normal roundness and is more or less elongated, shallow and flat. The femoral head in dysplasia is usually somewhat smaller than normal, but otherwise of normal configuration. The French surgeon Calot compared the shape of the normal socket to that of "half an orange" and described the acetabulum in dysplasia as looking like "half a lemon," cut lengthwise.

The primary defect in congenital dysplasia of the hip is a delay in proper development of the acetabulum, but this retardation and alteration of the normal forces of growth of the mesodermal tissue or of endochondral ossification is not limited to the acetabulum, but may involve all skeletal structures of the hip. Depending on the degree of slowdown in development, the abnormality may manifest itself in the mature animal over a wide range of radiographically recognizable defects, from mild deformities, showing loose fit of the femoral head in a reasonably rounded socket to severe crippling, with a nearly flat area in the acetabular region and early luxation. It is not uncommon to find representatives of the various degrees of abnormality in litter mates. It is important to keep in mind that it is only the delay in development, with its predisposition to subluxation, which is congenital. Starting from obscure initial stages, there develops a more or less progressive pathological process, which continues throughout the life of the individual. Depending on the severity of dysplasia, we may find, as time goes by, arthritic changes, coxa plana, subluxation and even complete dislocation of the femoral head from an inadequate socket.

Presented at the 25th Annual Meeting, American Animal Hospital Association, April 24, 1958, Chicago, Illinois.

Hip Dysplasia in the Human Patient

Hip dysplasia in the human patient was described by Hippocrates about B.C. 370. The French surgeon Ambroise Pare (1510-1590) was the first to express the thought that we seemed to be dealing with an hereditary abnormality. M. Andry, in his famous book, *Orthopedics or the Art to Prevent and Correct Deformities in Chil-*

dren, published in 1743, mentioned the remarkable case of a young woman with unilateral dislocation of the hip, who gave birth to six children, including three boys with dislocation of the hip, and three girls with apparently normal hips.

An article by Hooff in 1928, who studied over 1,000 cases, and subsequent report by von Verschurer in 1931, presented evidence to show that hip dysplasia in man is transmitted as a dominant characteristic with irregular manifestation. The most extensive investigation on the genetic aspects of hip dysplasia in man is that reported by Faber (1938) who described radiographic studies on ten families of children with this abnormality. The children had been presented as so called solitary cases, which means the parents knew of no additional cases in their families.

In the course of his work, Faber discovered 88 additional cases of hip dysplasia among the relatives of the afflicted children. He noticed that for each case of actual subluxation there were three additional cases of dysplasia without displacement of the femoral head, and these cases were recognizable only through radiography. Faber's diagrams with 98 dysplasia cases, 25 with actual subluxation and 73 with dysplasia without subluxation, added considerable weight to the concept that hip dysplasia in man is transmitted as a dominant characteristic with irregular manifestation.

Today we know that about one out of 1,000 newborn children has congenital hip dysplasia. Population geneticists have calculated for parents with normal hips who have already a child with hip dysplasia, that there is a 5% probability that their next child will also have hip dysplasia. If one of the parents with an afflicted child has hip dysplasia too, the probability is 10 to 15% that the abnormality will recur in the next child of this family.

With the enormous literature on hip dysplasia in the human being — a recent book by Hass alone gives about 2,000 references — there is no basis for the wait and do nothing attitude of some dog breeders who express the thought that a ten year research program is needed to get some idea as to what hip dysplasia is all about.

Canine Genetics

Of course, it was only in 1935 that the abnormality was first described in dogs by Doctor Schnelle, but for its diagnosis and for its elimination one can draw on 2,500 years of experience in human medicine.

In discussing the hereditary aspects of hip dysplasia in human beings, I wrote early in 1956 that Faber's data "makes one wonder whether we do not have, for each puppy having a subluxation, three or more in the family with hip dysplasia who go through life without ever being recognized, but pass on the subluxation gene to half of their progeny." As a working hypothesis, I postulated at that time that hip dysplasia may be transmitted in dogs, just as it is in man, as a dominant characteristic with irregular manifestations.

This hypothesis was in contrast to the then prevailing view among dog breeders that hip dysplasia was transmitted as a recessive and that its appearance could not be predicted. Closer inspection showed that this recessive notion was based on the observation that dogs who looked normal to the eye produced severely crippled offspring. No radiographs of the parents were taken to prove that they really had normal hips. This means, of course, that there was no scientific basis for the recessive "feeling" and, as our subsequent data show, the theory of a recessive mode of transmittance is untenable.

Mode of Transmission

A major stumbling block for the layman to understand the hereditary aspects of hip dysplasia has been the concept of "dominant with irregular manifestation." There is really nothing unusual about this mode of transmittance. It occurs in other human diseases, such as gout, pernicious anemia, hereditary hemolytic jaundice, and probably essential hypertension. Dominant means, of course, that only one parent needs to transmit the particular gene to produce an afflicted child.

If we are dealing with a strictly dominant pattern, the parent carrying the abnormal gene will always be afflicted and the disease will manifest itself in all children receiving the abnormal gene. When we speak of

dominant with irregular manifestations, we concede that the dominant gene may at times not be dominant enough to overcome counter-action by the environment it enters and there may be instances wherein the presence of the abnormal gene in an individual does not lead to the appearance of the disease. There is no such thing as an isolated effect of a gene.

After postulating a working hypothesis about dominant transmittance of hip dysplasia in dogs, breeders of subluxed puppies were contacted in an effort to obtain pelvic radiographs of the parents of afflicted litters. It was not easy to get these data, despite the fact that I promised confidential treatment of the names of the dogs involved. Many breeders, but fortunately not all of them, are determined to hide the appearance of abnormalities in their stock. This is a foolish attitude, especially among breeders of German Shepherds, since to the best of my knowledge there isn't a single one in this country who has not produced and sold or purchased a puppy with hip dysplasia. This attitude is often coupled with pretended eagerness to help eliminate this crippling defect and with pseudo-scientific gobbledygook, which refused to accept facts as facts.

Fortunately, there is also a small core of serious and honest breeders who have the welfare of their breed at heart and have cooperated to the fullest extent. Thanks to the cooperation of many deeply interested people — and this includes a number of veterinarians — I have now data on the hip status of the parents of 106 litters containing puppies with hip dysplasia.

Case Reports

In 99 out of 106 cases, at least one of the parents also had hip dysplasia. Only in seven instances or close to 7% of the cases did the parents have radiographically normal hips, though we could see in two of the normal dams what might be called a "taint." A tabulation follows:

Both parents normal	7
One parent HD, one parent normal	17
One parent HD, other parent unknown	64
Both parents hip dysplasia	18
Total	106

In figure 1 we can follow hip dysplasia through four generations. Dog number 35 has hip dysplasia, but the parents, 18 and 24, have normal hips and so does the rest of the litter.

One of the parents, obviously, must be a latent carrier. Also quite interesting are the normal bitches 38 and 41. Both have the same sire with hip dysplasia, no. 28, and come from afflicted dams, 22 and 29. These two cases, and we have two more later, are proof against a recessive mode of transmittance. If hip dysplasia were recessive, dog 28 and bitch 29, for example, would have to be homozygous for the trait and could produce nothing but afflicted offspring. On the other hand, hip dysplasia as a dominant characteristic provides that 25% of the puppies by two afflicted parents may be normal.

Figure 2 shows two latent carrier cases with normal parents producing subluxed puppies. The two bitches 108 and 119 have hip dysplasia. The parents, 101, 102, 88 and 107 are normal. The two afflicted are related, since no. 101 (the dam of 108) is also the granddam of 119. Furthermore bitch 84 with hip dysplasia is the great-granddam of both, 108 and 119. In 94 we have another case of a normal puppy produced by parents with hip dysplasia.

Figure 3 illustrates the trouble one breeder got into by starting out with afflicted stock, his foundation bitches 136 and 138. We see again an instance wherein two animals with hip dysplasia, 143 and 144, produce normal offspring 150. We also have a case where two normal animals, 170 and 171, have an afflicted puppy, no. 173. Though we do not have a radiograph of the sire of 171 (no. 142), we see that the granddam of 171 (no. 136) had hip dysplasia. Of 39 animals, which have been x-rayed, 32 or 82 % showed hip dysplasia. This extremely high incidence of hip dysplasia in German Shepherds is not uncommon and has been observed in various parts of the United States.

I recently heard that a veterinarian in an east coast southern state took pelvic radiographs of 25 German Shepherds in one week and found four with normal hips and 21, or 84%, with hip dysplasia. It is impossible to say exactly how many Shepherds in the United States have hip

FIGURE 1

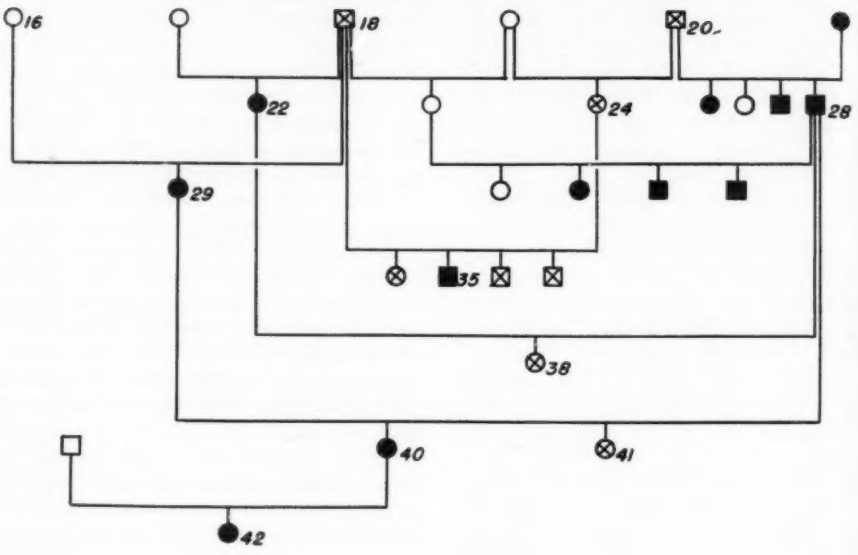


FIGURE 2

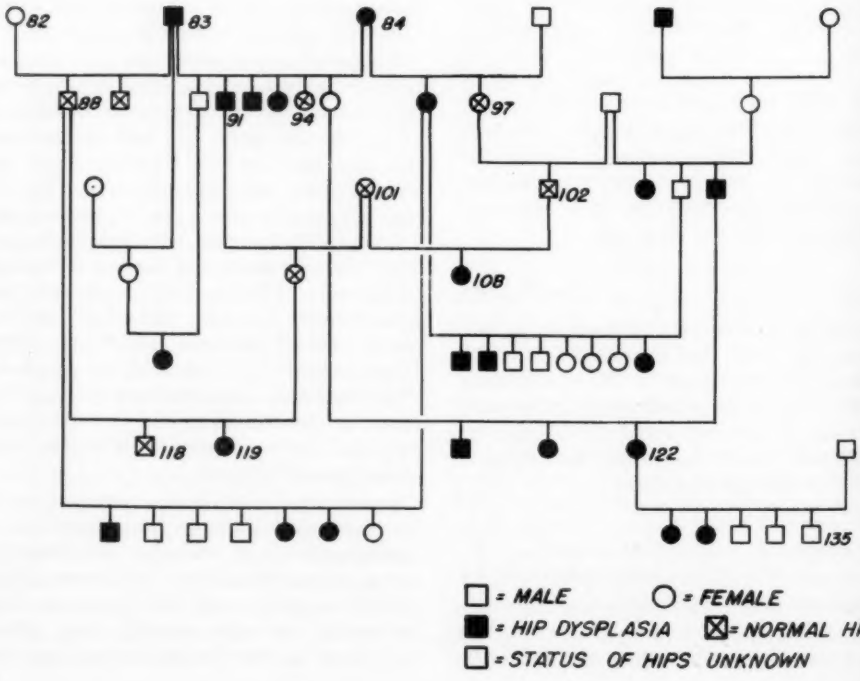
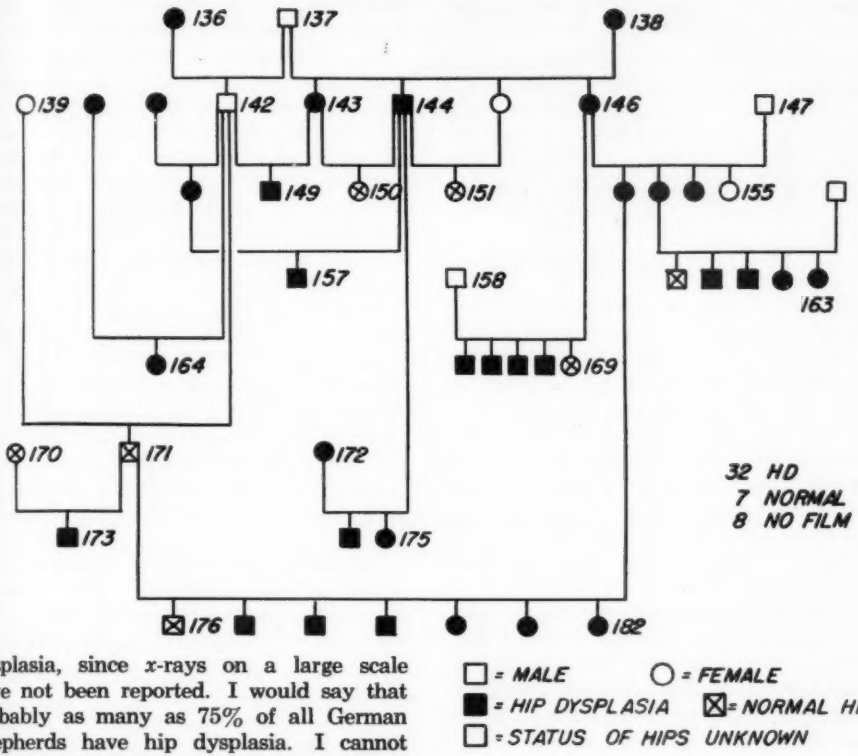


FIGURE 3



dysplasia, since *x*-rays on a large scale have not been reported. I would say that probably as many as 75% of all German Shepherds have hip dysplasia. I cannot make an estimate as to the frequency of hip dysplasia in the other 36 breeds which we know to have this abnormality, since I worked mainly with German Shepherds. It is quite obvious that a few other breeds are affected to the extent that one can speak of hip dysplasia as a nearly regular feature.

As a dominant trait, hip dysplasia can be eliminated much easier than if it were a recessive characteristic. That it is dominant with "irregular manifestations" complicates the elimination process somewhat. However, the job can be done, as Doctor McClave has shown in his work with Samoyedes, where a formerly seriously affected kennel now produces only puppies with normal hips, and without sacrificing valuable blood lines.

Dogs for Breeding

There is a strange notion among many people that a German Shepherd that can put one hind leg way behind the rest of the body, has a terrific rear angulation and looks pleasing. An animal may pose this way not because of any particular angulation, but because the lower thigh bone is far too long. The dog may also pose this way because it has weak hindquarters and feels comfortable and in balance only in this extreme pose. Radiographs which I have seen of a few dogs of this type showed hip dysplasia. These dogs cannot compete with a normal dog, as far as endurance and gaiting is concerned. Gaiting is not practiced in the small show ring. I should add here that a normal and sound Shepherd also puts one hind leg back when standing naturally, but only mildly so. A perpendicular line drawn from the ischium tuberosum should hit the ground not more than about an inch ahead of the foot standing toward the rear with the metacarpus in a vertical position.

After the pretty picture dog has won

Best of Breed at a number of shows, he becomes a popular dog, and if he has hip dysplasia, as is quite likely, he will contaminate numerous kennels with the hip dysplasia gene. I believe that the deliberate selection of such elegant looking dogs for breeding, while no attention is paid to working ability, is responsible for the marked increase in hip dysplasia among German Shepherds in the last decade.

Radiography Technic

Diagnosis is done by radiography. There are still veterinarians who cannot take radiographs suitable for diagnostic purposes. The equipment may not be powerful enough to take a good pelvic film, the developer may be old and the fixing bath may be exhausted. There are also some who are not familiar with the correct position of the hind legs for this type of radiography. I have seen such films with an incorrect position of the legs — a feature which hides hip dysplasia quite effectively.

Some of these films were accompanied by a certificate, saying that the dog had normal hips. Assuming that the veterinarian knows how to take and process a film, there comes the problem of interpretation. There is no reason why all veterinarians should be experienced radiologists. The two possibilities are: either our man must learn radiological diagnosis to the extent that he can interpret a film correctly, or must turn to an expert for consultation. There is nothing bad about consulting an expert.

The ability to interpret radiographs is not a congenital talent of all veterinarians, but something which must be learned. All films should be marked clearly as to the identity of the dog, to avoid confusion, errors and misrepresentations. I believe printing the AKC registration number of the dog on his film is the easiest foolproof method.

Serious breeders will not breed to anyone else's dog without either seeing the radiograph or a letter concerning this radiograph written by an expert they have confidence in. If the veterinarian renders merely a technical service, leasing the x-ray facilities for taking a film, and is not asked for an interpretation, there is little reason why he should not release the film. If the veterinarian makes a diagnosis on which he wishes to stake his reputation, he may want to have the film in his files as supporting evidence. In this case he could easily take two films, one for himself and one for the client. The client is justified in his desire to submit the film of his dog to an expert in the field. The intention of serious breeders to eliminate hip dysplasia should be supported by the veterinarian. The refusal to release film for examination by others makes the work of the serious breeder more difficult and he will turn to a veterinarian who is more cooperative.

If you encounter a dog with hip dysplasia, you should recommend strongly to your client not to use this animal for breeding. Such a recommendation should be coupled with a kind attitude and with friendly words, praising other qualities in the animal, such as good temperament, alertness, beauty of expression, and above all, trust and devotion to the master.

Test for Virus Diseases

A new blood test that detects the presence of the virus itself in blood, blood serum, or body tissues will make a significant change in virus disease control, according to University of Wisconsin veterinarians. Previous tests usually detected presence of antibodies against virus. Dr. D. R. Serge has noted that the test makes use of a well known principle — that antibodies against a disease clump with the virus which brings on the disease. In Serge's test, antibodies are turned into larger particles by attaching them to particles of a resin. Next, suspected virus-carrying material is added.

The test also allows a measure of how much virus is present. Virus-carrying material can be diluted to find the amount which carries enough virus to cause clumping.

Practical application of the test to hog cholera, vesicular stomatitis and virus diarrhea of cattle has been made. It is particularly valuable in testing hog cholera.

Carre's and Hard Pad Disease

Common sense observations and an historical examination of the unsolved distemper problem in animal medicine are presented for consideration by the practicing veterinarian. The writer suggests that the complex be viewed with attention to symptomatology and recognition of individual disease entities. These views are supported with a definitive list of differential characteristics of Carre's and hard pad diseases.

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THE TERM *distemper* today is vague, usually signifying a group of clinical signs associated with different disease conditions. In addition to virus diseases which exhibit similar symptoms, there are other anomalies, not of virus origin, which present a more or less typical clinical picture of what the general public considers to be distemper.

The dog is the only animal in which veterinarians diagnose distemper.

In human beings, distemper was once a common ailment. The word started out as a verb. Men and women were distempered. Later they had distemper, a disease. Gradually distemper came to mean any ailment. Now the disease is no longer diagnosed in human beings. The cycle has completed itself.

All farm animals used to exhibit signs of what was believed to be distemper. This disease has not been diagnosed routinely in swine for almost a century, however. It has not been suspected in horses since approximately 1935. And the disease that was once distemper in cats is now known variously as panleucopoenia, infectious enteritis, or virus pneumonia.

Distemper was never assigned to chickens. Instead they were afflicted with "the pip." The pip is now recognized as dozens of diseases.

Distemper Complex?

Why then do veterinarians continue to diagnose distemper in the dog, an animal on which much excellent research has been done and in which distemper is really a complex of diseases?

The distemper complex of diseases has been considered one disease for so long that we read in many recent reports that many diseases of the complex are simply variations of the same virus. But why is that assumption necessary? Does it not

seem logical that when two disease conditions are radically different, greater progress can be made in investigations by assigning them different names and considering them as distinct disease entities? In the human animal, no one calls measles, German measles, scarlet fever, scarletina, roseola and chicken pox by the same name and assumes they are the same disease. Yet several of these diseases have more symptoms in common than those produced by Carre's and hard pad. A comparison of two of these distemper complex diseases, Carre's and hard pad, is not without interest.

Differential Diagnosis

To be of assistance to younger practitioners, many of whom have never observed a typical case of Carre's, differential characteristics of Carre's and hard pad diseases are reported here. It will be noted that there are enough differences to preclude confusion of the two, and certainly to reassure those who want to be accurate in their diagnosis not to call them both distemper.

1. Carre's disease has been responsible in the past for many early deaths, all of them taking place long before the encephalitic stage of disease was reached. In an epizootic that occurred before biologics were available for protection, the writer lost 75 of 90 dogs, most of them during the early course of the disease. Some bloodhounds died promptly with the first rise in fever. In not one case has the writer observed the death of a dog with hard pad disease until the encephalitic stage had been reached.

2. In hard pad disease a high percentage of afflicted dogs develop encephalitis after the disease seems to have run its course, whereas the number exhibiting clinical signs of encephalitis following Carre's disease is probably not over 25%.

3. In Carre's, during the first rise of temperature, certain breeds—Beagles for instance—often develop convulsions, whereas in the case of hard pad disease, this anomaly has not been noted by the writer.

4. In Carre's disease, there is a diphasic temperature curve which is lacking in hard pad.

5. In hard pad, the foot pads become flinty hard, round or flattened, and when these start to peel, encephalitis generally follows, whereas in Carre's no hardening of the pads is evident, at least not more than is common in severe dehydration.

6. Dehydration is another important point of difference: In Carre's it is usually severe. One can lift a fold of skin on the back and it will not snap back to normal, but remain a fold. Hard pad is accompanied by little dehydration.

7. The percentage of recovery in Carre's is much higher than in hard pad cases, although the latter disease is much more severe. In Carre's the dog is often prostrate, losing nearly all ambition, whereas dogs suffering with hard pad often act fairly ambitious.

8. Appetite in dogs suffering with a hard pad condition is not unduly affected; the dog seldom loses a great deal of weight. In Carre's the dog suffers a great loss of weight.

9. Evacuations in the two conditions are much different. Many cases of hard pad have almost normal, firm stools, throughout the course of the disease; feces in Carre cases are generally loose, scanty, often bloody — all signs of severe enteritis.

10. The odor of a dog sick with Carre's disease is so characteristic that one acquainted with the disease could detect the sickness on opening the door of a kennel, or of a home in which such a dog has been ill. This is not true of hard pad.

11. When a pregnant bitch has Carre's disease, it resorbs the puppies and is only slightly affected by the disease. This is not true with hard pad. The latter disease does not cause resorption. A bitch may develop hard pads and encephalitis, and give birth to fairly normal puppies.

12. Discharge from the eyes and nose is copious in Carre's. The nose usually crusts over. The eyes may have to be manually opened because pus which accumulates underneath often etches the cornea and sometimes permits the aqueous humor to escape and a bulge to form through the opening.

13. In Carre cases, the sides of the dog's kennel are often sprayed with visible yellow mucus as are the dog's front legs. In hard pad cases there is but a fraction as much of either optic or nasal discharge.

14. Blued corneas are often a part of the

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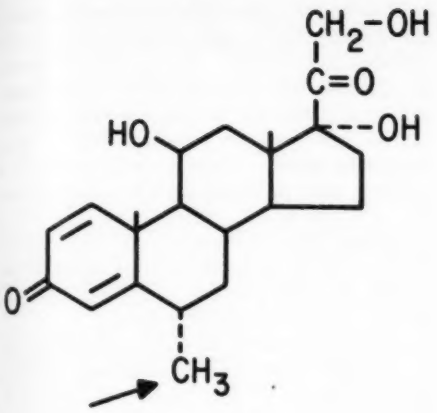

An annual review of current therapeutic agents that may find regular application in veterinary medicine has become a part of the continuing coverage extended veterinarians by this journal. Here the writer covers recent advances in pharmaceutical developments.

Current Therapeutic Agents

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PROGRESS IN VETERINARY THERAPEUTICS is rapid. This article reviews some of the recent advances in this field.

Methylprednisolone

Methylprednisolone, the most potent oral corticosteroid available, not only exceeds prednisolone in activity, but has even less tendency to produce sodium and water retention. It has three times the glucocorticoid activity of prednisolone, two times the anti-inflammatory activity, and less mineralocorticoid activity. The "halflife" value for methylprednisolone is appreciably longer than that for prednisolone.

Uses. Indications are indentical to those for prednisolone: dermal, allergic, ocular, otic, and musculoskeletal inflammatory conditions. Since methylprednisolone lacks significant mineralocorticoid activity in usual therapeutic doses, it is not likely to afford adequate support in acute stress conditions.

Dosage and Administration. Dogs and Cats: 5 to 15 lb., 2 mg.; 15 to 40 lb., 2 to 4 mg.; 40 to 80 lb., 4 to 8 mg. These are average total daily doses, which should be divided, if possible.

Poloxalkol

Poloxalkol is a oral wetting agent (surfactant) used as a fecal-softener in human beings. Its action is not dependent on the irritant, emollient, or bulk-producing properties common to most laxatives. Its constipation-preventing or relieving capacities are derived from its fecal-softening effect: poloxalkol lowers surface tension of the intestinal fluids normally present and thereby enhances their ability to penetrate and soften feces. Nonabsorbable and nontoxic, the agent does not interfere with absorption of nutrients, vitamins, antibiotics, or other medication, nor does it induce diarrhea. Use in animals has not been established.

Ethoxzolamide

Ethoxzolamide, the most potent oral carbonic anhydrase inhibitor available, is useful chiefly as a nonmercurial diuretic and

as a suppressor of aqueous humor production.

Uses. Indicated to produce diuresis in canine patients with mild to moderate congestive heart failure. Animals should first be satisfactorily digitalized. Used as an adjunct to digitalis and rest and with sodium and water restriction. Indicated to produce diuresis in certain edematous states, conditions characterized by hyper-potassemia, and in states in which production of alkaline urine is desirable.

Indicated to suppress secretion of aqueous humor in canine glaucoma. Used as an adjunct to topically applied miotics. This effect is independent of its diuretic action.

Dosage and Administration. In congestive heart failure of dogs under 40 lb.: 62.5 to 125 mg., if a resistant case, 250 mg.; of dogs over 40 lb.: 125 to 250 mg.; if a resistant case, 375 mg. To allow regeneration of the carbonic anhydrase enzyme system, the drug should be administered on alternate days or for three consecutive days in each week, to derive maximum effect. In glaucoma of dogs: 62.5 to 125 mg.

Tolbutamide

Tolbutamide is a non-hormonal synthetic agent found useful in regulating deranged carbohydrate metabolism in human patients with diabetes mellitus. While it is not an oral substitute for insulin, nor does it cure diabetes, it is capable of reducing and controlling the hyperglycemia characteristic of the disease. Administered to dogs at 100 mg./kg., as a single oral dose, there is at least a 30% reduction in blood sugar, and a significant degree of hypoglycemia persists for a minimum of 36 hours.

When 100 mg./kg. is administered daily to dogs for six months, blood sugar is maintained at approximately 60 mg.%. Because of the paucity of adequate clinical cases, recommendations for use of tolbutamide in canine diabetics have not been clarified.

Piperazine-Carbon Disulfide Complex

Powder forms containing the two well-known anthelmintics, piperazine and carbon disulfide, have previously been available for administration to swine. A suspension of the complex is now available, which broadens the indications to include horses, sheep, and poultry, as well as swine.

Uses. To remove large roundworms, small strongyles, large stronglyes, pinworms, and bots from horses; to remove nodular worms and common stomach worms from sheep; to remove large roundworms from poultry; and to remove large roundworms and nodular worms from swine.

Dosage And Administration. Dose is according to weight, species of animal involved, and anthelmintic properties desired, as per manufacturer's directions.

It may be given to horses by dose syringe or stomach tube, or in sweetened ground grain; to sheep by syringe or tube; to poultry in the drinking water; to swine by syringe or tube, or in drinking water or milk.

Hydroxyprogesterone Acetate

Whereas progesterone is relatively inactive when administered orally, ethisterone (anhydrohydroxyprogesterone) and hydroxyprogesterone acetate are highly active. The progestational activity of hydroxyprogesterone acetate is at least twice that of ethisterone, however. Its role as a gestagin has not been determined in the veterinary field.

Novobiocin

Novobiocin, an antibiotic effective against many Gram-positive and Gram-negative bacteria, has special activity against *Micrococcus pyogenes* var. *aureus*. Oral forms have been available previously, also combinations with other agents, such as novobiocin-penicillin, novobiocin-tetracycline phosphate complex, and novobiocin-tetracycline phosphate complex-prednisolone. During the past year there has been further definition of novobiocin's parenteral and intramammary role.

Uses. Indications comprise a wide variety of systemic bacterial infections in dogs and cattle, as well as bovine mastitis caused by *Streptococcus agalactiae, Streptococcus uberis,* hemolytic staphylococcus, and Pseudomonas.

Dosage and Administration. Dogs and Cats: 2.2 to 7.0 mg./lb. Cattle: 1.0 to 3.0 mg./lb. Doses may be administered intra-

muscularly or intravenously and should be divided, if possible, and administered every 10 hours. In bovine mastitis: 125 to 250 mg./quarter. May be repeated at 24 to 48 hour intervals.

Fluoxymesterone

An orally effective synthetic derivative of methyltestosterone, fluoxymesterone produces all the metabolic and clinical effects of methyltestosterone or testosterone propionate, but is more potent. In animal studies, the drug is approximately ten times as potent as equal amounts of methyltestosterone, from the standpoint of both androgenic and anabolic effects. Its veterinary role is unassigned.

Neomycin

Neomycin is a broad spectrum antibiotic with bactericidal effect against Gram-positive and Gram-negative organisms, including the genera Pseudomonas and Proteus. It has a wider spectrum of activity than penicillin, bacitracin, or streptomycin. During the past year, a new form of neomycin for antidiarrheal use was made available and the antibiotic's role as a systemic agent was further defined.

Uses. A highly water soluble form of neomycin is now available for use in preventing and treating bacterial diarrhea and bacterial enteritis in cattle, swine, sheep, horses, poultry, and dogs. Because it is virtually unabsorbed following oral administration, neomycin's effect is concentrated in the gastrointestinal tract. Broader parenteral use in cattle and dogs has come into clinical prominence.

Dosage and Administration. As an antidiarrheal agent, 70 mg. neomycin base per 20 lb. total body weight; 245 mg. per 65 lb.; 490 mg. per 130 lb.; 3.5 gm. per 1,000 lb. The approximate dose should be added to the amount of drinking water which will be consumed in 12 hours. It may also be mixed with milk or feed, or be administered as a concentrated solution by dose syringe or stomach tube, or may be given as the powder in gelatin capsules. As a systemic antibiotic, neomycin sulfate may be injected intramuscularly in dogs at a total daily dose of 5 mg./lb.; in cattle at 1 to 2 mg./lb. Doses should be divided, if possible, and administered every eight hours.

Intravenous Fat

Introduction of intravenous fat during the past year makes complete parenteral alimentation a reality. Fats, which yield over twice the number of calories per unit of weight than proteins or carbohydrates, have heretofore been used only experimentally because of technical obstacles to the preparation and administration of fat emulsions intravenously. Each 500 cc. supplies approximately 800 calories. The preparation is indicated primarily in human patients suffering from malnutrition and unable to take adequate food by mouth, which may include being prepared for surgery, those whose gastrointestinal tracts are not functioning postoperatively, those with extensive burns, those with severe traumatic conditions, those with gastrointestinal disease or who are unable to absorb fat adequately, and certain ones with acute or chronic renal failure in whom maximum nitrogen sparing is indicated. Its role in animal medicine has not yet been established.

Methoxsalen

Methoxsalen is derived from the active principle contained in the fruit of *Ammi majus.* In human beings this compound, together with exposure to sunlight or other sources of ultraviolet radiation, has the unique property of affording protection against sunburn, as well as enhancing skin pigmentation. The protective action of the drug, however, apparently does not depend entirely on increased pigmentation. The role of methoxsalen in the various photosensitivities of large and small animals (Collie-nose) remains to be determined.

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CASE REPORT

Bilateral Pneumonia and Pulmonary Edema in a Gorilla

LESTER FISHER, D.V.M.

Berwyn, Illinois

ON DECEMBER 20, 1958, Irvin Young, our largest male gorilla at the Lincoln Park Zoo, died. He was approximately 12 years of age, and weighed 364 lb. He arrived from Africa in 1948, and had an excellent health record during his stay. He was sick on the morning of December 19, with clinical signs of an upper respiratory infection. He was slightly off food, had a cough, and a rhinitis.

Treatment was started with Coricidin tablets (Schering) and cough syrup at three to four hour intervals. Later that afternoon, the cough was a little worse. Oral antibiotic therapy (chloromycetin) was started — 500 gm. every six hours. On the morning of December 20, he seemed a bit worse with some dyspnea noted. Treatment was continued and he took some food and liquid. He coughed up fluid during the day and after one seizure of coughing fell over dead.

Outstanding lesion at autopsy was a bilateral pneumonia with considerable pulmonary edema. Probable cause of death was anoxia due to the extensive pulmonary involvement. Tissue sections were taken from all major organs and sent to the pathologist for study and report. The remains of the body appeared to be completely normal and no evidence of parasites was found. The comparative size and gross appearance of the internal organs were similar to that reported in Steiner's anatomical study of Bushman.

Veterinarians are often confronted by clients with questions regarding the normal sexual behavior of pets. Discussion of the subject here by the writer will not only improve the practitioner's knowledge of this much ignored subject, but also enable him to discuss it intelligently with his clients and thus alleviate misgivings clients sometimes entertain about their pets.

Sexual Inversion and Homosexuality in Dogs and Cats

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TRUE HOMOSEXUALITY does not exist in apparently healthy dogs and cats. Some homosexual tendencies exist in all normal dogs and cats. It is also more common in the male than in the female. While homosexuality in man may often be attributed to psychological maladjustments, this relationship has not been established in animals. The explanation of homosexual manifestations in the healthy dog and cat is encompassed within the sphere of its normal activities.

From the standpoint of endocrinology, an individual is never totally male or totally female. By definition, a male individual is one in which the male hormones predominate, and a female is one in which the female hormones predominate. It is logical to presume, therefore, that if some pathological process should disrupt this hormonal predominance in either sex, then corresponding changes in sexual behavior should occur. Limited though it is, the evidence on hand seems to bear out this contention.

Sexual Inversion

While sexual inversion is rare in male dogs, cases of dogs with testicular carcinomas have been reported in which the affected male seems to undergo a variable degree of feminization, manifesting itself in seeking to be copulated by other males, being indifferent to females in heat and even becoming an object of sexual desire for normal males. This is the closest approximation of true homosexuality in dogs, that is, where the sexual drive seems to be clearly directed to achieve sexual satisfaction with a member of the same sex. One French author believes that these testicular tumors elaborate female hormones or other substances analagous to them that undergo alteration by metabolic processes and terminate in feminization. Still more rarely, feminization is said to come about as a consequence of certain pituitary, adrenal or thyroid tumors, though specific instances of this causal relationship in dogs or cats have never been brought to my attention.

I am not aware of specific medical cases of the masculinization of female dogs or cats. The cases most often mentioned among domestic animals are those of cows, in which these animals assume a remarkable abundance of the physical and mental attributes of the male. The condition is considered to be caused by various tumors of the ovary, adrenal, pituitary, thyroid or thymus, or it may be a manifestation of an

excess of male hormones due to a simple functional variation of these several glands. There is no reason why similar cases should not occur in the dog and cat. Reports of such cases would be an enriching addition to our meager veterinary literature on this subject.

Normal female dogs or cats exhibit certain distinctly masculine traits in that they often attempt to mount either male or female in the male fashion. Where this occurs before puberty, it is very likely attributable to the temporary preponderance of male hormone. It may also be a mere prepuberal sex play manifestation. In mature females, this behavior occurs most commonly during the heat period and seems to be one of the ways in which an aggresive female arouses an unresponsive male to sexual activity.

Also, male cats in the absence of a female in heat will often seek to copulate with each other. However, if a female in heat will come upon the scene, then both males will immediately attempt copulation with the female. These activities are normal for mature male cats. So it would seem that male cats are normally bisexual, that is, that they will readily copulate with either male or female, depending upon which is available at the time that the male happens to be aroused.

Homosexuality

In regard to homosexuality among otherwise normal dogs or cats, the most that can be said is that while these animals unquestionably engage in homosexual behavior, it is at best not true homosexuality because there is no evidence that it is consciously directed to the exclusive attainment of sexual satisfaction in the sense of homosexuality among human beings. A male dog may lick the genitals of another male because of the curiosity aroused by the appearance and smell of an abundant preputial discharge. This act may sexually stimulate the dog acted upon, but the act itself seems to be of an investigational nature rather than sexually motivated. Male dogs may mount each other in play or even after having been stimulated in the normal fashion by a female. Actual intromission with subsequent orgasm is possible, though most often very unlikely. Females occasionally lick each other's genitalia more as a grooming procedure or out of curiosity rather than because of any sexual approach. The fact that the female acted upon may be stimulated by this procedure is beside the point. While the act itself may be classified as a homosexual activity, it does not appear to be homosexually motivated.

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Treatment for Virus Diarrhea

If intestinal bacteria are controlled with the proper antibiotic, calves can often recover from pneumonia-enteritis.

Research at the University of Wisconsin has revealed that *Escherichia coli* in the upper part of the intestines accompanies diarrhea, the outstanding sign of pneumonia-enteritis. In normal calves this bacterium is found only in the colon.

Chloromycetin rapidly decreased the number of bacteria in the upper intestines and helps prevent diarrhea.

CARRE'S

Continued from page 150

Carre picture, with bluing affecting the external layers of the cornea. No cases of eye bluing in hard pad have come to the writer's attention.

There may be other signs to aid the practitioner in making a differential diagnosis. The above, however, should indicate that there are two diseases with greater differences than exist between many other human and dog diseases. Accordingly, Carre's and hard pad diseases should no longer be designated distemper.

CLINICAL REPORT

Canine Urinary and Respiratory Infections

Treatment with a New Antibiotic Combination

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PENICILLIN, the first antibiotic "wonder drug," was used extensively in human medicine before it became generally available to veterinarians. Even after it became available the veterinarian was obliged for some time to use human dosage forms. Introduction of broad spectrum antibiotics, including the most recent tetracyclines, to veterinary medicine took a similar course via unwieldy human dose formulations.

In an antibiotic combination (Albaplex Capsules — Upjohn) tetracycline phosphate complex, a new, rapidly absorbed tetracycline salt, and novobiocin sodium have been combined in equal parts (60 mg.) and constitute a development based on veterinary dosage forms.

Microbicidal Effect

Tetracycline Phosphate Complex.[1,2,3] Tetracycline is one of the most widely used broad spectrum antibiotics in animal medicine. Tetracycline phosphate complex differs from other forms of tetracycline in that it is relatively insoluble in water and gastric juice. However, it is readily absorbed from the gastrointestinal tract, producing higher serum concentrations of tetracycline in the first few hours after administration than are obtained with the hydrochloride salt. The antibiotic is excreted mainly through the kidney.

The microbicidal activity of tetracycline phosphate complex encompasses a broad range of Gram-positive and Gram-negative bacteria — alpha and beta streptococci, many strains of micrococci (staphlococci), Shigella, *Klebsiella pneumoniae,* certain clostridia, *Aerobacter aerogenes,* and some strains of Salmonella. The tetracycline activity is also effective against *Endamoeba histolytica,* rickettsia, and certain large viruses (the lymphogranuloma-psittacosis-trachoma group) which includes *Miyagawanella felis,* the cause of feline pneumonitis.

Novobiocin Sodium.[3,4,5,6] Novobiocin is an antibiotic produced by *Streptomyces niveus.* Like penicillin, novobiocin is acidic in nature and stable to the degree of acidity or alkalinity present in the gastrointestinal tract. Following oral administration to dogs, peak blood concentrations of novobiocin are obtained within two or three hours; high levels are found at 12 hours; and detectable amounts remain in the serum for at least 24 hours. When appreciable amounts of novobiocin are present in the serum, the drug diffuses into the pleural and ascitic fluids but not into the cerebrospinal fluid. Novobiocin is concentrated in the liver and bile and is excreted via both feces and urine.

While novobiocin is active against both Gram-positive and Gram-negative bacteria, *in vitro* studies show that it is exceptionally active against *Micrococcus aureus, Streptococcus hemolyticus, Diplococcus pneumoniae,* and some strains of *Proteus vulgaris.* The importance of the exceptional activity against micrococcus is indicated in a recent report[7] in which the authors point out the great increase in bacterial resistance to antibiotics: In a series of micrococci isolated from hospitalized human patients, 90.5% were resistant to penicillin, 65% to tetracycline, and only 1.5% were resistant to novobiocin. Regarding the sensitivity of

micrococci to the nine antibiotics studied, the authors stated that novobiocin "was by far the best inhibitory agent" and was "impressively bactericidal" against the many strains of micrococci isolated in this study.

Combined Effect.[8,9] Experimental studies of combinations of novobiocin and tetracycline in various rations show no antagonistic antibacterial effect. The combination produces reinforced action, particularly against micrococci, with a wider range of antibiotic activity than can be obtained by using either antibiotic alone.

Case Reports

The following case reports are representative of a number of urinary tract and respiratory tract infections in dogs treated with Albaplex. In this series, there were no side effects.

Case 1. Dachshund, female, two years of age. Urinalysis: Albumin, 4+; pH, 7.5; positive for blood; sediment, crystals, casts, WBC, RBC present. Gram stain: Micrococcus. Diagnosis: Urocystitis. Treatment: Vitamin A administered intramuscularly, 100,000 units; Albaplex, 1 capsule t.i.d. Rapid recovery.

Case 2. Dachshund, spayed female, eight years of age. Urinalysis: Albumin, 3+; pH 7.5; sp. gr., 1.013; acetone and sugar negative; sediment, WBC, RBC. Diagnosis: Chronic urocystitis with calculi. Treatment: Urolithotomy, vitamin A, hyaluronidase; Albaplex, 1 capsule t.i.d., 7 days. Results: Good.

Case 3. Collie, female, two and a half years of age. Urinalysis: Albumin negative; pH, 7; sp. gr., 1.030; sediment, WBC, RBC, fat globules. Diagnosis: Urocystitis. Treatment: vitamin A; Albaplex, 1 capsule t.i.d., 5 days. Recovery.

Case 4. Dachshund, male, eight months of age. Released from dog pound with enlarged submaxillary lymph nodes, temperature 103.9, coughing, diarrhea. Diagnosis: Upper respiratory infection and gastroenteritis. Treatment: Antidiarrheal; Albaplex, 1 capsule t.i.d., 3 days. Temperature normal next day. Results: Very good.

Case 5. Cocker Spaniel, male, ten months of age. Respiratory signs and diarrhea. Diagnosis: Upper respiratory infection and coccidiosis. Treatment: Expectorants, vitamins parenterally. ACTH; Albaplex, 1 capsule t.i.d., 9 days. Results: Excellent.

Case 6. Fox Terrier, female, nine months of age. Coughing, Diarrhea. Diagnosis: Upper respiratory infection and coccidiosis. Treatment: Multiple vitamins, expectorants, antihistamine, Albaplex, 1 capsule, b.i.d., 4 days. Results: Good.

Case 7. Fox Terrier, male, seven years of age. Coughing. Diagnosis: Chronic bronchitis. Treatment: Expectorants, codeine; Albaplex, 1 capsule b.i.d., 4 days. Results: Good.

Summary

Albaplex Capsules are a combination of equal parts tetracycline phosphate complex and novobiocin sodium, designed especially for treatment of canine and feline patients. It is a combination of antibiotics formulated for small animal use on a milligram-per-pound basis. In a representative series of three canine urinary tract infections and four canine respiratory tract infections, the combination was effective and safe.

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Although the question persists as to whether the animal, the plant, rumen microorganisms, or a combination of these, are factors responsible for bloat, in vitro *comparisons were made to determine how several pasture plants could contribute to formation of stable foam.*

Pasture Bloat

Stable Foam and Gas Production Capacities of Pasture Plants In Vitro

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WHETHER THE ANIMAL, the plant, rumen microorganisms, or combinations are factors responsible in pasture bloat is still a moot question. Various theories have been discussed and a comprehensive report was prepared by the National Research Council, Committee on Animal Health.[1] A recent report[4] indicated that both the animal, through its saliva, and the plant, through its composition, may be involved in the development of excessive quantities of stable foam in rumens.

Experimental Procedures and Results

Studies on the incidence of bloat were made throughout two seasons using a herd of 32 Jersey cows. Bloat occurred on 21 of the total of 131 days the animals were on pasture in 1955 and on 38 days of the 146 total days in 1956. This is approximately 16% of the days in the first year and 35% in the latter. The 21 days in 1955 when bloat occurred were divided among 13 periods and the 38 days in 1956 among 19 periods for a total of 32. Half of these 32 periods were of a single day's duration, seven each of two and three days but only two as long as four days. No attacks occurred during the first 44 days in 1955 and the first 14 days in 1956. In both years, the longest bloat free period after the first cases were encountered was 20 days. Attacks were prone to occur during three periods in the day, each approximately one to two hours after going back to grazing. The first was between 9:00 and 10:00 a.m., the second about 3:00 p.m. and the third between 7:00 and 9:00 p.m. In 1955, the respective number of attacks for each of these periods was 33, 9 and 36 while in 1956 they were 43, 11 and 17.

Twenty-one of the 32 cows had attacks of bloat in 1955 and 11 in 1956. All ages from first-calf heifers to 11-year old animals were involved. Some animals had but single

The authors wish to acknowledge the assistance of H. R. Smith, D.V.M., J. L. Parsons, Ph.D., and R. R. Johnson, in the conduct of this study.

attacks while others had many, with the greatest number recorded for any individual cow being 22. This occurred in 1956 and the same cow had three attacks the previous year. Only three other animals suffered attacks in both years.

Rumen samples were obtained[6] from eight different bloated cows grazing pastures containing alfalfa, Ladino and a little brome grass. Samples were also obtained from two normal cows in the same herd on four occasions each. Estimates of relative concentrations of protozoa were within normal ranges in the samples from both bloated and unbloated animals. The same was true of the two groups of organisms that have been designated as Hay I and Hay II flora.[5,6] A difference noted between the samples from the bloated and normal animals was the presence of chains of streptococci in all but one of the eight samples from the former and in only one of eight samples from the latter (table 1). However, with possibly one exception, the prevalence of these organisms was within usual ranges. Thus it appears unlikely that either the bacteria or the animals play more than complimentary roles in providing the changeable factors that result in excessive quantities of stable foam in rumens.

An *in vitro* comparison was made of several pasture plants to determine what qualities might be present that could contribute to the formation of stable foam encountered in bloat.

Foam Capacity Test

An *in vitro* test was used to estimate the relative foam capacity of plant tissues. Freshly cut plants were passed through a Hobart food chopper; 25 gm. of this material along with 150 ml. of water were placed in a Waring blender which had volume graduations on it, and were blended for one minute. The mixture was squeezed in cheesecloth, 150 ml. of the liquid put in a clean blender and beaten for five seconds. A minute later the reading was taken on the volume of foam present. Tests were conducted weekly or more often during the summer.

Average quantities in milliliters of foam obtained from plants examined were as follows: orchard grass, 110; brome grass, 185; birdsfoot trefoil, 188; Ladino clover, 200; and alfalfa, 230. The ten samples of alfalfa used in this average were from fields when bloat was not occurring. The foam from 14 samples from bloat producing pastures averaged 229 ml. It appeared, therefore, that considerable foam capacity was present in all plants and was not increased in plants from bloat producing pastures.

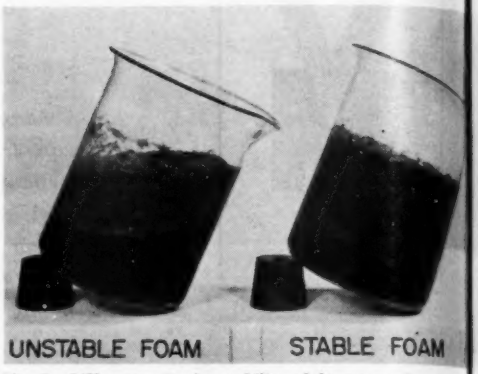

Fig. 1. Differences in the stability of foams as shown by tilting the containers.

Stable Foamy Mass Test

This test was designed to measure the ability of the various plant tissues to support stable foam like that observed in rumen samples from bloated animals. Plant tissues were processed by chopping in the Hobart food chopper as for the foam test. For the most part, the same samples were used in both tests. One hundred ml. of water was placed in a Waring blender having volume graduations on it. Chopped plant tissues were gradually added, 10 gm. to begin with, followed by beating for one minute. Additions of the plant tissues were repeated until a stable foamy mass was produced. The "end-point" was a stability of the mass sufficient to prevent it from moving when the blender cup was tilted over and capable of holding the excess liquid in place. This phenomenon was evident after the mass had been standing five minutes.

Stable foamy masses were produced using samples of alfalfa collected weekly or more often during the season from the pastures being grazed or from ones having a similar growth period. Plant fibers readily broke into short pieces and the mass became consistent throughout. It was possible to pro-

duce comparable stable masses from Ladino clover but not from birdsfoot trefoil, brome or orchard grass. In the latter three plants, masses became stiff as greater quantities of plant tissues were added. However, they varied in consistency all through the mass; free liquids oozed out on top and elsewhere and the long fibers formed in clumps. The masses would not remain stable on tilting but would permit the liquids in the bottom to move about and thus it was easier for gas bubbles to pass through, unite or escape. The difference in the character of the stable and unstable mass is illustrated in figure 1.

The average quantity of alfalfa required to produce a stable foamy mass using plants obtained from pastures when bloat was occurring, did not differ from that when it was not. The quantity for the former was 52.8 gm. and for the latter 53.0 gm. with the range for the total of 22 samples being 42 to 58 gm.

A limited check of various alfalfa plants with different growing periods was made to determine the quantities required to produce stable foamy masses. The average of two samples of one week's growth was 70 gm.; three samples of two weeks averaged 65.3 gm.; six samples of three weeks growth 61.9 gm.; eight samples of four weeks 51.3; two samples of five weeks 50.8 gm.; and two samples of six weeks 56.9 gm. Greater quantities of younger plants were needed than older ones, apparently because of higher moisture content.

Tests were conducted on 18 different varieties of alfalfa plants without encountering any noticeable differences in the quantities required to produce stable foamy masses. Presumably therefore, it is unlikely that a variety exists which is not capable of supporting stable foam.

The importance of the physical structure of the fiber in forming stable masses was further demonstrated when a mass of relatively similar character was produced using washed alfalfa fiber beaten into an alfalfa juice and water mixture from which much of the solid material had been removed by precipitation with heat at 80 C.

Substitution of rumen juice from animals on either pasture or dry feed for the water used in the foam capacity and stable mass tests gave the same results as water. From this it was concluded that rumen juice samples did not contain appreciable quantities of agents capable of changing foam stability. The effect of saliva was not checked but since rumen samples contained considerable amounts, action from this source would be expected to be limited.

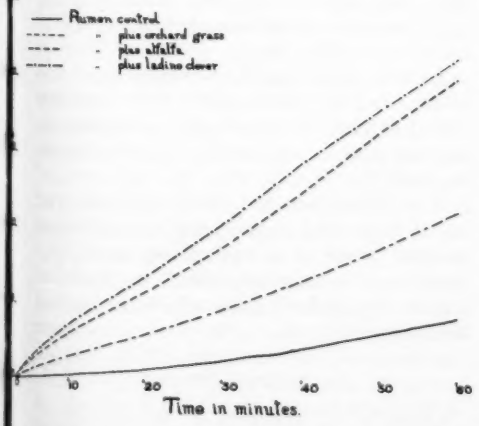

Fig. 2. Volumes of gas produced *in vitro* by incubation of pasture plant tissues with fresh rumen contents.

Gas Production Test

Preliminary work using a third test was undertaken to measure the quantity of gas produced *in vitro*. Various plant samples were exposed to the action of microorganisms in freshly collected rumen contents. The proportions used were arrived at by trial and error and consisted of 20 gm. of rumen contents, 5 gm. of chopped plant tissues plus 10 ml. distilled water. These were placed in flasks held in a constant temperature water bath at 39 C. Flasks were connected by tubes to inverted burettes filled with water and standing in a water bath, thus permitting gas volume to be measured as it displaced water. The period of observation chosen was an hour since this was the approximate period after feeding when bloat attacks occurred in animals grazing plants under study.

Presented in table 1 are the results of three trials using rumen contents from three animals. One animal was on dry feed rations of hay and grain, one a normal animal on legume-grass pasture, and one a

bloated cow on the same kind of pasture. The results of the test using rumen contents from the normal animal on pasture are shown also in figure 2. Ladino clover produced the greatest additional gas in all 3 trials with alfalfa being close behind and grass the lowest. In another trial using rumen contents from a bloated animal in which alfalfa and birdsfoot trefoil alone were compared, the alfalfa quantity was 27.0 ml. and the birdsfoot trefoil 19.1 ml. whereas the rumen sample alone was 11.6 ml.

Average quantity of gas produced by rumen samples alone was 6.0 ml. for two samples from animals on dry feed, 10.1 ml. for two samples from normal animals on pasture and for four samples from bloated animals 8.0 ml. The latter observation that samples from bloated animals gave no higher gas production than those from normal cows on pasture is contrary to that of Hungate, *et al.*[3]

TABLE 1. The Volume (ml.) of Gas Produced *in vitro* by Incubation (39 C.) of 20.0 gm. Rumen Contents and 5.0 gm. of Plant Tissues

	Rumen Contents Source			
	Hay and Grain	Pasture Normal	Pasture Bloat	Average
Rumen contents	5.6	8.2	3.8	5.5
" " + Orchard	13.1	22.4	6.8	14.1
" " + Alfalfa	16.3	29.9	8.3	21.5
" " + Ladino	18.7	42.5	10.1	23.8

Discussion

Plants were rated similarly by all three measures; foam, stable foamy mass and *in vitro* gas production tests for estimating relative ability to contribute to rapid formation of stable foam. The potentials were higher in alfalfa and Ladino clover than birdsfoot trefoil, or orchard grass. It is perhaps noteworthy that fiber suitable for the formation of stable foam was present only in the two plants, alfalfa and Ladino, which are frequently associated with bloat problems and not in the grass and birdsfoot trefoil, two that are seldom or never involved.

The importance of the fiber was further emphasized with later findings that a large portion of fresh alfalfa plant substances responsible for initial rapid gas production were closely associated with the fiber fraction. Additional results suggest that the materials concerned are pectic substances and hemicelluloses. A preliminary report on these latter phases has recently appeared.

Summary

There were 157 attacks of bloat in a two-year period in a herd of 32 dairy cows grazing on legume grass pasture. Attacks occurred on 16% of the total pasture days in the first year and 25% of the second year. There were 32 short periods in the two years when bloat occurred. Half were of one day duration, seven each of two and three days and only one was four days long.

Rumen samples from eight bloated cows on legume pasture contained, on the average, more long chains of streptococci although within normal limits than samples from normal animals; but the usual groups of organisms used as indicators were not disturbed.

The capacity of pasture plants to produce foam when added to water and submitted to the action of Waring blenders was lowest in orchard grass and increased in other plants in the following order, brome grass, birdsfoot trefoil, Ladino clover and alfalfa.

Stable foamy masses were produced by alfalfa and Ladino clover when mixed with water in Waring blenders but not by birdsfoot trefoil, orchard or brome grass. The deciding factor seemed to be the type of fiber. Important differences between alfalfa varieties were not encountered among the 18 submitted to the test.

Ladino clover produced more gas than alfalfa and the latter more than birdsfoot trefoil or orchard grass when incubated for an hour *in vitro* with freshly obtained rumen contents.

The potentials for rapid formation of stable foam thus were higher in alfalfa and Ladino clover, the two plants frequently associated with bloat, than in birdsfoot trefoil and orchard grass which are seldom incriminated.

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Concluded on page 168

Editorial

VETERINARY MEDICINE—A MATURE SCIENCE

"We are like dwarfs seated on the shoulders of giants; we see more things than the ancients and things more distant, but this is due neither to the sharpness of our own sight, nor the greatness of our own stature, but because we are raised and borne aloft on that giant mass."

So spoke Bernard of Chartres, the 12th century philosopher, and his words even now retain a ring of wisdom. In truth, the veterinary profession has nothing that has not been given, nothing that has not been handed down and used again and again. If veterinary medicine finds new ways of thinking, it is only because the same questions are asked again and again as the science matures, as it passes through the long intellectual process called development.

The essence of veterinary science is that it must be fresh — each generation must build a new story onto the house inherited, the house the profession inhabits, the house of veterinary knowledge. If traditions are seen only as dark, dismal leasons wedged between ancient superstition and modern ignorance, it is only because we forget that we are standing on the shoulders of giants.

In every profession, as in every science, new ways of thinking emerge from the prevailing social process in which the entire community is involved. At the same time the best of the old forces are cemented into place by subtle forces that seldom ascend to the level of clear consciousness. Publishers, teachers, leaders — all those vested with the function of serving as intellectual advisors to the veterinary profession — are in a position to color the complexion of academic advice. This group in a large measure affects the power of ideas, both when they are right and when they are not.

Implicit in this responsibility is not only the right to free expression, but the demand for equally responsible analysis of those expressions. Charges have sometimes been leveled that the profession is plagued by ideas at variance with the basic realities of the community in which the veterinary practitioner serves. It has been suggested that the meat food industry demands a side departure from the principles that have thus far elevated veterinary medicine to its professional status. This charge bears analysis. If true, the profession should know why it is true. If not, refutation is in order.

Whenever a problem confronts society, there is always someone standing by to push the panic button, someone ready to sound a warning of damnation if we do not escape the domination of past precedent and establish new leadership capable of dealing with the new order. Panic mongers are never standing on the shoulders of giants. Fortunately, for every single prophet of gloom there are at least 100 analytical minds. When all the facts are gathered in and issues assembled, valid ones can be retained and the course of events reshaped sufficiently to meet every change of events. Criticism soon spends itself as evolutionary progress takes command of the field.

At this stage in the development of the profession in America, the time has arrived for professional analysis of the problem at hand. Professionally trained veterinarians must assemble the facts and chart the course of the profession in relation to agricultural trends.

What is the problem? One can detect certain changes in the development of the agricultural economy, which is the patient we serve. A trend to larger operating units is noted, but the trend is not sufficient to suggest malignancy. The majority of units seem to be following an established pattern of growth. There is considerable evidence to indicate that the feed industry, which has been serving agriculture, is undergoing some major re-alignments for greater efficiency. *Based on this history it appears that the professional problem is how can veterinary medicine best serve this growing patient.*

On detailed examination it can be readily determined that the bagged feed industry which has supplied the livestock operator in the past is no longer able to serve efficiently. Labor and transportation costs are not acceptable to large feeding operations and compensation can already be seen with the elimination of bags and institution of bulk shipping and storage methods. The local distributor and mixer can be expected to be sloughed in time, with supplements moving directly to the feeder for mixing with local ingredients and incorporation of drug additives to meet specific requirements of the individual feeding operation. This looks like an improvement for the large feeding operation, but may constitute some new problems for the medium sized independent operation which has relied heavily on the counsel of local feed suppliers and pre-mix medications.

The magnitude of disease management in the large scale operations and the increasing technical problems of the medium sized operation are self evident.

A tentative diagnosis of inadequate professional guidance at the local level can be established. Evidence of more group practices and complete hospital facilities for diagnosis and surgery indicate that proper initial therapy has been instigated. As the patient grows there will be an increased demand for this type of service. It is obvious that the patient will soon require professionally prescribed feed medications for most efficient performance plus advanced diagnostic service. An increasing flow of practicing veterinarians returning to universities for one or two years of advanced training in nutrition and pathology suggests that the proper therapy will be ready when needed.

The case of the growing, developing agricultural economy appears to be in good hands, with a flexible profession moving quietly but efficiently to serve it in the best possible manner. If our panic-button friends will devote their energies to informing their neighbors what the veterinary profession is doing for this fast growing rambunctious patient, the profession will supply the service needed to carry on.

Suckling Pigs Salt Needs

Research workers are investigating the salt requirements of suckling pigs in an effort to aid in the development of a balanced ration. Findings may also be useful in combating baby pig losses. No similar tests have been made on pigs at this stage.

University of Illinois College of Veterinary Medicine research workers used pigs ranging in age from 19 to 34 days. The studies showed that pigs fed 0.45% salt retained the highest percentage of sodium. The recommended salt requirement for weaned pigs is 0.5%.

The test pigs were fed a synthetic ration containing all the known growth factors and minerals. All pigs were placed in individual metabolism cages designed for quantitative collection of urine and feces. The data were used to calculate sodium balances for a 24-hour period. Positive balances were obtained for dietary concentrations of sodium varying from 0.45% to 2.34%. Sodium retention was quite variable even among litter-mates.

NEW ZEALAND NEEDS VETERINARIANS FOR GROWING ECONOMY

Spectacular increases in production and better utilization of resources have laid a solid foundation for New Zealand's high standard of living. In 50 years the sheep population has doubled and the number of dairy cows has increased four-fold. Transportation facilities have expanded and new manufacturing industries developed.

A Growing Nation

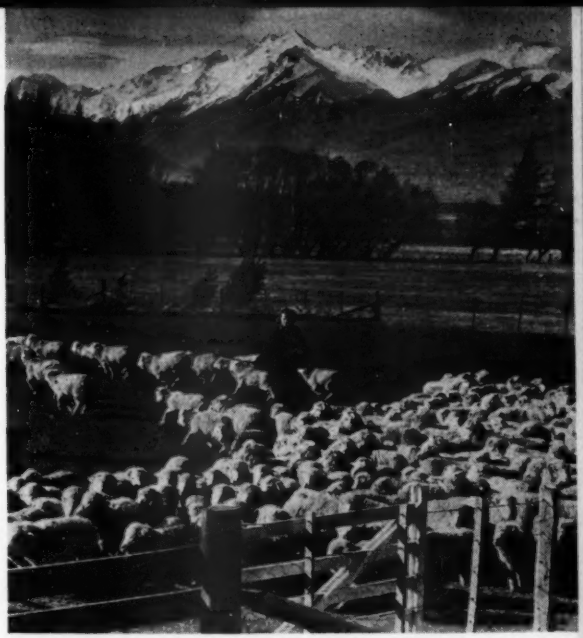
There are now over 17,000 vacant jobs in industry and the time is far distant when requirements will be met in full.

Because New Zealand farming is based chiefly on the grazing animal, the role of the veterinarian in the Dominion's livestock industry is vital. In line with expansion of agriculture, the New Zealand Department of Agriculture has positions available on the staff of its Animal Industry Division at various locations.

Veterinarians — to Maintain Health

The primary concern of these veterinarians is to maintain the health of farm animals, which is done mainly by advice and guidance to farmers. Field work in the prevention and control of diseases, investigation of disease outbreaks, quarantine and vaccination procedures are important phases of the work. Veterinarians also supervise meat inspection and tuberculin testing.

The New Zealand mainland extends nearly 1,000 miles from north to south. A total area of 103,000 square miles makes the country a little larger than the combined areas of New York, New Jersey and Pennsylvania.



Snow-clad peaks of the Burnett Range loom majestically in the background at Glentanner Station, Canterbury, New Zealand as sheep are driven home for "eye-clipping and drenching." Animal husbandry is an important economic art in this country "down under."

Although there are several large plains, New Zealand is a mountainous country with over two-thirds of its area between 650 and 3,500 ft. above sea level.

The main islands lie in the temperate zone in a location corresponding to that of Italy in the northern hemisphere. The climate is generally pleasant. Seasonal differences are not great in most parts, surrounding ocean water prevents extremes of temperature.

New Zealand fishing is world-renowned. Rainbow and brown trout have been introduced into hundreds of streams, rivers and lakes. Ten-pound trout are not uncommon. In the South Island rivers, Quinnat salmon range up to 40 lb., and Atlantic salmon up to 5 lb. Unlimited opportunities for hunting of deer, wild pigs and birds rank with big game fishing for Swordfish and Marlin as big sport.

But the real future for the veterinarian in New Zealand revolves about the nation's expanding animal industry. For veterinary progress to keep pace with the meat food and fabric needs of both a growing nation and export market is the first challenge.

See the classified ad in this issue for further information.

Animal Health

R. R. DYKSTRA, D.V.M.

Lengthening the Femur

In the October 1958 issue of *Military Medicine* Wm. I. Gay, D.V.M., of the Veterinary Corps, has an article entitled A Method for Surgical Lengthening of the Femur of the Dog. The purpose of the intervention is to adjust the length of the femur when (1) non-union of fractured ends have left a shortened femur; (2) to correct a defective femur position that remains after union has taken place, (3) and to correct inability to use the limb normally following a previous fracture.

The first step in the operation is to expose the femur by "an incision on the lateral side of the leg from the trochanter to the proximal edge of the femoro-tibial joint." The old fracture area is removed including old callus material until the normal cortex is exposed so that it can be made smooth, and the ends concaved with a burr.

The prosthesis is constructed of stainless steel alloy having an outside diameter corresponding to that of the bone under treatment, and one-half inch longer than the space between the divided ends of the fractured bone. Also on each end of the prosthesis a four sided point makes contact with bone ends beneath the cortex to prevent rotation on the long axis. An intermedullary pin is driven into the proximal end of the bone, and the prosthesis put in position with one point against the proximal segment. The prosthesis and the intermedullary pin are then aligned with the distal segment, and the pin extended into the distal segment of the bone.

The periosteum or as much of it as available is placed in position to hasten formation of the involucrum, followed by usual outer wound handling. Post operative splinting is not practiced, though the animal is to be caged and kept inactive for a four weeks period.

Milk Fever

The Ohio Agricultural Experiment Station, in reporting on the prevention of milk fever in high producing cows, notes that if five days before freshening the animal is given 20 million units a day of vitamin D—usually divided into 10 million units morning and evening—in the feed, and continued for one day following parturition, highly satisfactory results can be obtained. The vitamin D was either in the form of irradiated yeast or an oil concentrate. It is cautioned by the researchers that there may be toxic effects if administration of the prescribed dosage is extended for more than a total of seven days.

Control of Sheep Parasites

Research seems to indicate that two chemicals—the trade names are Trolene and Korlan, the latter being a technical grade of the former (chemically 0.0-dimelhyl 0-2, 4,5- trichlorophemyl phosphorothiate) show promise in controlling parasitism in sheep such as screwworms, nasal bots, blowflies, etc. Descriptive material points out that the named agents have high insect toxicity coupled with low mammalian toxicity. Furthermore, it is reported that there is rapid elimination after the preparations have been orally administered. For external parasites preparations are employed as a spray or as a dust.

Growth Booster for Cattle

University of Nebraska scientists have reported surprising results after feeding steers fungicide-treated seed corn left over from planting. The corn not only proved to be safe, but boosted gains 10.3% and reduced feed requirements 10.1%. The fungicide, Orthocide 90 contains 90% Captan.

Books reviewed in this department and any other books, if available, may be obtained by remitting published price to the Book Department, VETERINARY MEDICINE, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

Practitioner's Bookshelf

FOLK MEDICINE, by *D. C. Jarvis, M.D.;* 182 pages. Henry Holt and Company, New York, Publisher, 1958. Price—$2.95.

This book by a Vermont physician purports to provide "a new theory on the treatment and prevention of diseases ranging from the common cold to arthritis." For several reasons it will be of more than ordinary interest to veterinarians. The publishers state that Doctor Jarvis' theories show "folk medicine's indebtedness to veterinary medicine and close-to-the-soil observation of animal, human, and insect habits." The major premise of the book is that the addition of apple cider vinegar and honey to the diet will prevent or cure most diseases by maintaining an optimal biochemical balance in the body.

Doctor Jarvis writes convincingly of a subject on which many persons are skeptical. His observations, based upon fifty years of experience in rural Vermont, are carefully documented with the results of experiments on domestic animals, in which it would appear that he frequently played the role of veterinarian as well as medical researcher. If his regimen appears too simple, his results would indicate further trial of his methods.

In one herd of 54 dairy cows, 23 had failed to conceive, some for as long as a year. Two ounces of vinegar were poured on the ration twice daily beginning November 1. All 23 cows had conceived by the end of February. A friend had five boxer bitches from which only one litter had been obtained the previous year. A tablespoonful of vinegar daily was prescribed, and in the following year all five bitches produced litters. "The object of the apple cider vinegar, with its potassium and associated mineral content," Jarvis says, "was to create within the animal bodies the will for orderly growth and production of offspring." He states that the topsoil of Vermont is deficient in potassium.

The veterinary bill for one herd of 45 Jerseys had never been less than $150 annually. After four ounces of vinegar were added to the daily ration, veterinary services were required only twice in the 14 months Jarvis studied the herd. After vinegar was added to the ration in these herds, mastitis cleared up, the bacteria count of the milk went down, and the normal texture of the udder was restored. Milk production was increased, and hay consumption was decreased. Jarvis states that $90. worth of vinegar saved $655. in feed, and about 75% of cows with chronic mastitis can be restored to profitable production. In one herd abortions stopped after vinegar was added to the ration.

Other observations include the reduction of enlarged knees and the relief of arthritis in cattle. It is also stated that lice will leave cattle given vinegar and iodine, and flies will not bite them. Vinegar will increase the staying power of hunting dogs, cause more rapid feathering and growth in chickens, and increased redness of the bone marrow in turkeys. A form of dizziness in ranch mink disappeared when vinegar was added to the ration.

In summary form all this seems a bit on the improbable side, and a major criticism

of the work is the apparent lack of adequate controls. The full text of the book, however, should be read before too hasty a conclusion is drawn. Doctor Jarvis' observations are stated in such conservative manner that they can hardly be called "claims," and the matter seems worthy of further consideration. The book makes fascinating reading; only a small part of the subject matter — that of greatest veterinary interest — is touched upon here.—*J. F. Smithcors, D.V.M.*

THE DIGEST OF RESEARCH ON UREA AND RUMINANT NUTRITION. Du Pont Company Polychemicals Department, Publisher. Price — $2.50.

The most modern scientific data available on ruminant nutrition — with emphasis on the efficiency and practical application of urea in ruminant feeding — have been made available in this book, a hard-backed volume, which delves thoroughly into the early and most recent nutritional studies by the world's leading authorities. The book itself provides for a better understanding of the role of non-protein nitrogen in the ruminant diet.

Among the subjects discussed in detail are new data on natural sources of urea, in addition to synthetic urea as fed in ruminant rations; the effect of carbohydrates, trace minerals, and proteins; the role of fatty acids; and urea as a dietary source of nitrogen for non-ruminants.

THE WAY COWS WILL BE MILKED ON YOUR FARM TOMORROW. Babson Brothers, Publishers. Price — Free.

Practical help on a streamlined milking system is available without cost in this new 32-page planning book.

How to save hundreds of miles lugging milk and feed with a milking parlor, how to plan for the most efficient loose housing, how to eliminate daily manure handling, head off udder troubles, boost milk production and quality — all are topics covered.

The book contains a complete and up-to-the-minute collection of pictures, drawings and data on parlor milking. Its writers toured colleges, experiment stations, and successful parlor installations in varying climates of the western hemisphere. Leading dairy authorities, farmers and manufacturers have all contributed their latest findings to the new planbook.

From it, your dairy clients can plan parlor and loose housing systems to avoid mistakes and save cost. Help is also available from local Surge dealers on final blueprints.

For your free copy of the new 32-page Planning Book, write Dept. VM Babson Bros. Dairy Farm Research Service, 2843 West 19th Street, Chicago 23, Illinois. You can recommend this new book to dairymen as a part of mastitis control recommendations.

Antibiotic to Sows

Terramycin injections in sows 12 hours after farrowing have been found effective in preventing gastroenteritis in baby pigs. One gram of terramycin in sterile water, injected into the sows, prevented this diffuse diarrhea condition of baby pigs. The injections resulted in a 10% increase in the number of pigs saved until weaning. Injection of terramycin after diarrhea was contracted in baby pigs ended diarrhea in one to three days following treatment. — *Feedstuffs*, August 16, 1958.

BLOAT

Continued from page 162

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Ready acceptance of professional advice on money matters by veterinarians has prompted the editors of VETERINARY MEDICINE *to more fully explore the problem as it affects the average practitioner. Here the writer gives practical answers to the practitioner's needs, stressing the value of a definite money management plan.*

Professional Money Management

CAMERON K. REED

President, United Funds, Inc.
Kansas City, Missouri

NOT LONG AGO, a professor in the Business School at Ohio State University said:

"Money is, perhaps more difficult to manage than it is to earn. If an individual is willing to devote years to preparing himself for a better-paying job, he should surely be willing to devote some study to the vitally interesting and equally important subject of the sensible use of his money."

I couldn't agree more enthusiastically!

After 40 years in the investment business, I am still amazed at the large number of people who make only haphazard efforts at managing their money. By "managing," I mean carefully planning a program of investment for the purpose of putting your money to work for you.

The average man's knowledge of corporate finance is quite limited; consequently, he is hesitant to risk his limited judgment in buying stocks, even in our largest and best-known companies. Yet stocks represent one of the most significant "hedges" against the dollar-depreciating effects of inflation.

Financial Security

The old theory that all you need is a few bonds, some mortgages, and a good bank account is now outmoded by inflation. In the light of present inflationary outlooks, and continued long-range depreciation of the dollar's purchasing power, what the average man needs today is, at least, a partial investment in stocks. Yet, limited knowledge and fear of fluctuations frequently deter action.

The practical answer is that everyone needs three things:

1. Cash — a sound bank account, or short-term government bonds, to meet everyday emergencies.

2. Insurance — to cover the hazards of life.

3. A definite plan — to build for a real stake in the future of our great American corporations; not only for the possible profits that may be derived, but as a hedge against the inflation that appears to be here to stay.

The third point — a definite plan — is,

in my opinion, the most vital need of the average man today. Naturally, there is no perfect answer to "hedge" the losing purchasing power of the dollar. However, mutual funds seem to offer a particularly sound approach through the medium of "dollar cost averaging."

Mutual Funds

Before going into dollar cost averaging, let's examine the mutual fund idea itself. A mutual fund is an investment company, and there are some 150 in the nation today. The sole purpose of the mutual fund is to invest the money that its participants (shareholders) invest in it. The money is pooled into a single sum, and this, in turn, is invested by professional investment management in a wide diversification of companies and industries.

Thus, the shareholder obtains three distinct advantages:

1. Diversification of his investment to an extent that would be virtually impossible except for those of considerable wealth.

2. Professional management, which, backed by staffs of experienced researchers and analysts, selects and maintains continual supervision over the investments.

3. Convenience.

One of the nation's leading mutual funds has investments in 130 companies in 21 different industries. This is typical of the largest common stock mutual funds. Such diversification lessens the risks that are inherent in stock investments, although it cannot entirely eliminate the risk.

The advantage of professional management can be likened to the benefit one derives consulting a veterinarian for the treatment of an ailing animal. The wise farmer wouldn't dream of performing surgery on his cow. The owner of a small pet wouldn't attempt treatment for virus hepatitis in his Terrier. Instead, both consult a qualified specialist — the veterinarian.

The same reasoning should apply to investment management. The average person does not have the time, training, experience or facilities to prudently select stocks, and maintain a continuing vigil over the investments. The professional investment manager is a specialist in his field; he has spent many years in the business and financial world. His investment decisions are based on this experience, coupled with careful study of the cold, unemotional facts that emerge from painstaking research.

Another factor that makes the mutual fund a practical plan is convenience. A single certificate — representing the shares you own in the fund — replaces the many certificates that would require processing and bookkeeping if you owned the various investments individually. Up-to-the-minute record-keeping chores are handled for you by the mutual fund. Also, the fund guarantees a ready marketability for your shares.

Another decided convenience is represented in the accumulation plans — the program in which you may "invest by the month" (or by the quarter).

Through their accumulation plans, the mutual funds provide the important advantages of "dollar cost averaging." Dollar cost averaging is simple. It makes little difference whether you are buying bushels of wheat or shares of stocks. It can apply in both cases (except the shares purchased through a mutual fund will fluctuate from time to time in accordance with the underlying value of the securities held in the particular fund's portfolio).

Dollar Cost Averaging

Dollar cost averaging involves the monthly or quarterly purchase of the same dollar-amount of mutual fund shares — as opposed to purchasing the same number of shares each month or quarter. Thus, if you invest $100. each month, you will receive varying amounts of shares with each investment, according to the price of the shares on the day of the purchase. You thereby force yourself to buy more shares when the general market (and the value of the Fund's portfolio) is down, and fewer shares when it is up.

Consequently, from the long-range standpoint, your per-share cost would be less than if you had accumulated the same total number of shares by purchasing the same number of shares each month.

There is one sure rule in stock investment — the value of stocks will fluctuate. Therefore, in starting an accumulation plan, the investor should continue regular periodic investments despite the prevailing

market situation — whether it is "up" or "down." In this way, he receives the benefits of "dollar cost averaging."

If the investor discontinues his plan (particularly after a year or so), he may suffer a loss. Also, if stocks happen to be at an extreme "low" when he desires to liquidate, he may even then experience a loss. However, past experience has shown that a consistent program of cumulative investment, at regular time intervals, will show the investor a considerable profit over an eight to ten-year period. It should also serve as a real hedge against the depreciating purchasing power of the dollar.

A Practical Plan

Does a mutual fund provide a practical investment plan for a practicing veterinarian?

The answer can be found in the tremendous growth of the funds in recent years — clear evidence of the ever-growing public awareness of the mutual fund as a practical plan, a definite program for investment management. One out of every six owners of publicly held stocks today is an investment company shareholder. The number of investment company shareholders more than quadrupled in the 1940-1958 period. In the same 18-year period, the total assets of the nation's investment companies have mushroomed from around one billion dollars to 14 billions.

Individuals in the professions represent the largest single occupational group among the nation's mutual fund shareholders.

The mutual fund is particularly effective as a practical plan in that it provides means for attaining various objectives. If current income is your goal, there are funds whose investments are particularly geared toward this objective. Other funds are designed to seek long-range objectives — to build an estate, to provide for retirement income, or to amass funds for your children's education.

Thus, the veterinarian is able to participate in a program tailored to meet his own individual objectives.

The biggest factor toward financial success, in my opinion, is a definite plan beyond the two necessities — ready cash for emergencies, and insurance to cover life's hazards. Mutual funds offer the ideal plan for practical and prudent investment.

Hagen Named to USDA Post

Dr. William A. Hagen of Ithaca, New York has been named director of the United States Department of Agriculture's new National Animal Disease Laboratory, now under construction at Ames, Iowa. His appointment was announced by Dr. Byron T. Shaw, administrator of USDA's Agricultural Research Service.

"Recent announcement by Cornell University of Hagan's planned retirement as dean of the New York Veterinary College presented us with the opportunity of filling the position with the best qualified of men," Shaw said. "The leadership that Hagan has given to make the New York Veterinary College pre-eminent in the field of research and education will similarly contribute to the National Animal Disease Laboratory."

Shaw described Hagan as "uniquely fitted to foster the close federal-state cooperation that will make this laboratory a key unit in our nation's veterinary medical research and regulatory efforts."

Hagan will be on leave without pay except for intermittent periods until January 1, 1960, at which time he will assume his full-time duties. The new laboratory will be completed and in operation about November, 1960.

Doctor Hagan for many years has served as consultant on a wide variety of animal disease and other veterinary medical problems. In 1944, during a year's leave of absence from Cornell, he completely reviewed the field activities of the department's Bureau of Animal Industry and made recommendations for continuing improvements. In 1946-47, he was a member of the secretary of agriculture's advisory committee on foot-and-mouth disease. He contributed his energy, time and skill to the establishment of the U. S. Animal Disease Laboratory, Plum Island, New York.

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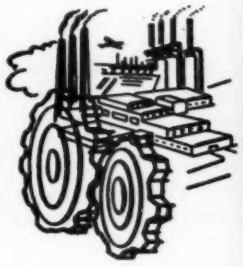

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"OFFICES COAST TO COAST"

Animal Care Panel to Meet

The presentation of the 1958 Griffin Award, the election of officers for the forthcoming year, and reports ranging from "An Early History of Animal Experimentation and Care" to "A World Survey of Monkey Services" and "International Aspects of Laboratory Animal Care," highlighted three days of technical discussion at the 9th Annual Meeting of the Animal Care Panel, held in Chicago, Illinois, December 3-5, 1958.

The Charles A. Griffin Award for 1958 was presented to Dr. John B. Nelson, in recognition of his outstanding contribution to the field of disease control of laboratory animals.

K.V.M.A. Elects Officers

Dr. Loyce D. Jernigan, a practitioner from Council Grove, Kansas was named president of the Kansas Veterinary Medical Association by the group in convention at Wichita, January 15. Dr. Albert V. Schwartz Jr. of Salina was elected president-elect; Dr. Melvin W. Osburn, Manhattan, was named secretary-treasurer.

Radioactive Isotopes

The U. S. Atomic Energy Commission is giving increased impetus to the use of radioactive isotopes by the medical profession and other groups. In the veterinary field there is to be constructed a high intensity food irradiator nicknamed "Hi-Fi" — for use by the Army Quartermaster Corps to treat up to 1,000 tons of food a month. It will also be used to sterilize drugs that would be damaged if attempts were made to sterilize them by heat or chemicals. The isotope used is radioactive cobalt.

Williams Joins Sterwin Chemical

Dr. William P. Williams has joined Sterwin Chemical as a poultry specialist. A well known veterinarian, Doctor Williams will serve in the department headed by Dr. R. C. Sherwood, vice-president and technical director of the company.

"CAP-CHUR" EQUIPMENT

Automatic projectile type syringe delivered by a specially designed pneumatic rifle.

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Doctor Williams will provide technical assistance on poultry problems to Sterwin's customers in the southeastern states. He will also maintain close technical relations with veterinary schools, poultry husbandry departments, and experimental and research stations in connection with Sterwin products for the poultry and feed industries.

Hog Integration

Vertigration of the hog industry may be exaggerated, according to a *Successful Farming* report. Reasons cited are as follows:

1. The hog cycle is longer, more pronounced. Even integrators are squeamish when prices sag.

2. A chasm between production knowledge and production know-how, which prompted integration in the broiler industry, is not available in the hog industry. Hog growers miss few bets in putting know-how to work.

3. The advantage of mass production is almost endless in broiler production; not so with hogs.

Distaff

MRS. E. F. (HAZEL) EBERT

Parasites

I often think of a picture which adorned one wall of Dr. E. K. Glover's office. There was a large pup scratching his head, a smaller pup was looking up at him and said, "What's the matter, you got bugs?" The larger pup said, "Yes, ain't everybody got bugs?"

I expect the wives of veterinarians are more conscious of "bugs" than the average wife because she hears her husband talk about so many different species of parasites.

These parasites live in clean, healthy environment, in decomposed, filthy surroundings, internally or externally with animal hosts.

It is not necessary nor possible for a veterinarian's wife to learn the scientific terms for all parasitic life, but if we are going to be the interested listeners we hope to be we should know some of the common names.

Parasites External and Internal

Parasites, both external and internal, do not confine their activity to domestic or wild animals; many of them find man good hunting ground. The severity of diseases caused by parasites depends partly on the number of bugs in the host.

Although man may have infections of internal parasites in the intestinal tract, internal parasites are more common in animals. One reason for this is the difference in food. Much animal food is raw, and often contaminated by excretions, soil, or stagnant water, and larvae are ingested with the food and water.

There are no exact figures on the monetary loss caused by parasites, but a conservative estimate has been given at $125,000,000. a year. This estimate includes the cost of drugs, veterinary services, and lay labor in the control of parasites. But it does not include the loss of weight, the extra feed costs, nor the loss in production, which would be difficult to compute. This gives some idea of the tremendous job the veterinarian faces.

Parasitic Infection

Internal parasites are many, causing various diseases in cattle, swine, sheep, horses, poultry, fur bearing animals, dogs and cats. The intestinal tract, stomach, lungs, kidneys, circulatory system, the nervous and musculatory systems, the bones and even the heart of animals can become infected with internal parasites, and much damage can result.

The different mange mites are common external parasites. Demodectic, sarcoptic, psoroptic are the most common mange mites. Some animals are hosts to more than one species of mange mites, just as they may have more than one type of internal parasites, which include coccidia, nematodes or roundworms, lungworms or tapeworms.

Control

There is no plan or system that will completely control parasites. They can be controlled somewhat by rotating pastures, providing clean water, fencing off infected land. Treatment of the animal for the destruction of worms from animals is part of the veterinarian's work, and the wife can be of much help if she can prepare the specimen for her husband to examine.

FIBREPLEX KENNELS

Fibreplex Kennels are superior one-piece molded fibreglass kennels, designed and engineered to the most exacting standards for modern use. Manufactured from selected resins and fibreglass for maximum strength, durability and utility, yet priced amazingly low.

Fibreplex Drying Kennels are an innovation in drying kennel design. Radiant heating is combined with a powerful blower to dry animals rapidly without chilling. This dryer will be an attractive addition to your hospital equipment.

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Doctor Fincher Receives Award

Dr. M. G. Fincher of Cornell University was made an "honorary doctor" of the faculty, Veterinary College, University of Salonica, Salonica, Greece. Doctor Fincher has been working in the clinic and lecturing at the school under a Fulbright scholarship.

Doctor Fincher is shown above being presented the scrolls of parchment, one a diploma and the other the voting certificate of the faculty of the veterinary college by Dr. Konstantine Vlachos, dean. The faculty voted unanimously to recommend to the rector of the university that this distinction be given Doctor Fincher.

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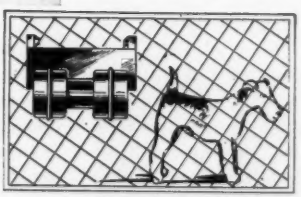
SPECIFICATIONS

Twin 3" nozzles. Air output 2800 linear ft. per min. at normal room temps. 115 Volt, 60 cycle single-phase self-cooling AC operation. Finished in satin black enamel with silver screen.



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This department will announce each issue new therapeutic items, equipment, services, and literature of interest to veterinarians. All claims made are those of the firms concerned. Send communications to the address noted.

Reader's Service

Deravet designates a new antibiotic feed additive designed to stimulate growth and aid in disease prevention and treatment for poultry, swine, and sheep. The product contains 10 gm. Aureomycin chlortetracycline per pound in a water-dispersable base. For indications and other details, check with American Cyanamid Company, 30 Rockefeller Plaza, New York 20, New York.

Detjen Insectocutor is a combination lantern and insect electrocutor for use as night light in front of an animal clinic. It provides illumination and at the same time destroys all night flying insects drawn by the light. Practical and attractive, it is also safe and sanitary. The lantern is 14 in. high, 9½ in. in diameter and weighs 6½ lb. It is complete with transformer, killing grid, hanger hook, and removable catch basket. For information and price ask Detjen Corporation, Electrocuting Fly Screen Division, Pleasant Valley, New York.

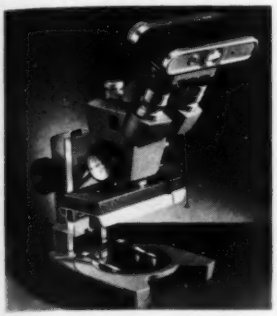
Jakes Dog Food designates a product containing Argentine horse meat. Guaranteed chemical analysis: 64.5% water, 28.9% protein, 4.8% fat, 0.78% fiber, 1.02% ash. Manufacturers claim exceptional flavor and palatability for the product. Distribution in the east is good, but dealerships are still being set up in the west. For information, write Lifespan Products Company, 70-10 Seventy-Fourth Street, Middle Village 79, New York.

Improved Pellet Implanters are being offered free with each purchase of 100 or more Synoves-S (steers), Synovex-H (heifers) or Synovex-L (lambs) implants. Designed for interchangeable use with all Synovex products, the implanter permits implantation of the natural hormone preparation specifically developed for the particular type of animal. Pellets are implanted by inserting the needle point through the raised skin of the ear. For information, ask Squibb, 745 Fifth Avenue, New York 22, New York.

E. R. Squibb

A line of **Stainless Steel Animal Cages** in stationary and mobile models is made of heavy gauge metal and features smooth, bacteria proof seams and rounded inside corners. Designed with an integral, reinforced steel frame with pre-drilled holes to permit easy tiering and assembly into multicage units, stationary CliniCages are available in a wide range of sizes. Product is produced by Clinicage of Chicago.

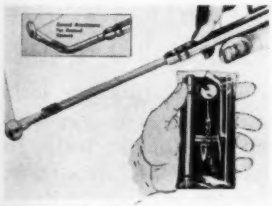
A New Concept in **Stereophotomicrography** is now available with the development of a special Stereocamera attachment. Designed specifically for use with the American Optical Cycloptic Stereoscopic Microscopes, the unit consists of a 35 mm. Graflex Stereocamera and is adapted with a special prism



American Optical Co.

compensating system. The adapted attaches directly to the microscope stand and permits camera to be swung into and out of position over the eyepieces. Actual camera technic is simple and involves no time-consuming manipulations. For details check with American Optical Company, Instrument Division, Buffalo 15, New York.

A **Pocket Flashlight and Inspection Kit** fits shirt pockets and operates on two pen-lite batteries, and enables the operator to see in otherwise hard to reach areas. The tool is extremely useful for examination when



Foster Supplies

electricity is not readily available. For information and price, write Foster Supplies Company, 6122 Milwaukee Avenue, Chicago 46, Illinois.

The first **Broad-Spectrum Antibiotic** to be marketed in aerosol containers for use on dogs and other animals has been announced by American Cyanamid Company. The spray, containing Aureomycin chlortetracycline, is designed to help prevent infection from superficial wounds, such as cuts, sores, and skin abrasions.

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VETERINARIAN: Wanted Missouri licensed veterinarian for A.A.H.A. Hospital. State all particulars in first letter. Address Box 561, care VETERINARY MEDICINE.

RESEARCH VETERINARIAN: Opportunity for graduate veterinarian interested in career with leading ethical veterinary supply company. Requirements include executive potential and intense interest in keeping abreast of developments in veterinary science. Please write, stating personal and professional qualifications and starting salary expected. Address Box 563, care VETERINARY MEDICINE.

RESEARCH VETERINARIAN: Progressive manufacturer of feed medications and animal health products wants man as part of its expansion program to conduct therapeutic studies on diseases of animals. Advanced degree or some research experience preferred but not required. Address Box 564, care VETERINARY MEDICINE.

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CLIPPER BLADES: Precision ground and sharpened like new. Avoid C.O.D. Enclose 75 cents each set. Professional Grinding Service, Lawndale Ext., Ret. 2, Box 558, Greensboro, North Carolina.

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ESTABLISHED MIXED PRACTICE: In prosperous Virginia community. Reasonable price includes fully equipped ranch styled small animal hospital and apartment, air-conditioning, two-way radios, etc. Easy terms. Address Box 562, care VETERINARY MEDICINE.

DOG BOOKS: Write us. Canine Genetics, $5. K'l Bldg. & Plans, $3., (for remodeling your hospital). Training all breeds, $3. Judy Publishing Company, 2517 Michigan Blvd., Chicago 16, Illinois.

VACANCIES FOR VETERINARIANS

Government of New Zealand

The New Zealand Department of Agriculture has vacancies for veterinarians on the staff of its Animal Industry Division at various locations.

Because New Zealand farming is based chiefly on the grazing animal, the role of the Department's Veterinarians in the Dominion's livestock industry is vital. Their primary concern is to maintain the health and well-being of farm animals, which is done mainly by advice and guidance to farmers.

Field work in the prevention and control of stock diseases, the investigation of outbreaks of animal diseases, and quarantine and vaccination procedures are important sections of the work.

Veterinarians are also required to supervise the work of meat inspection at freezing works and abattoirs and to be active in tuberculin testing of dairy cattle.

The qualification required is a degree in veterinary science.

Salaries depend upon experience since graduation and are up to an initial maximum of £1,390 a year. There is scope for advancement beyond this to senior administrative posts in the Department.

Further information and forms of application may be obtained from the New Zealand Embassy, 19 Observatory Circle, N.W., Washington 8, D. C.

Applications close in Washington, 1 April 1959.

LONG ESTABLISHED PRACTICE: In Midwest. Dairy, hogs, and small animals. Selling home, hospital, drugs and equipment due to other interests. Address Box 560, care VETERINARY MEDICINE.

VETERINARY MEDICINE MAGAZINES: Old copies of January, February, September and November 1958 and January 1959 issues of VETERINARY MEDICINE are needed. For every issue turned in, your subscription will be advanced one month. Send to VETERINARY MEDICINE, 803 Livestock Exchange Building, Kansas City 2, Missouri.

Examinations

Idaho

Examinations for license to practice veterinary medicine and surgery in Idaho are scheduled to be held in Boise June 25-26. Applications to take the examination should be received at the State of Idaho, Department of Law Enforcement, Occupational License Bureau, Boise, at least 30 days prior to the date of examination.

North Carolina

The North Carolina State Veterinary Examining Board will meet June 23-25 to examine applicants for a license to practice veterinary medicine in the state of North Carolina. The meeting will be held at the Morehead Biltmore Hotel, Morehead City, North Carolina.

IN MILK FEVER . . .

TO RAISE AND MAINTAIN CALCIUM LEVELS . . .

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Calsem-DM presents a stable solution containing calcium gluconate 20%, dextrose 20%, calcium glycerophosphate 2%, magnesium chloride 2%; in water, with stabilizer and preservative. As replacement therapy, Calsem-DM supplies an effective concentration of calcium until Parterol takes effect.

Parterol is an oil-soluble steroid which raises the blood calcium level following parturition. It acts by mobilizing calcium stored in the bones and by increasing the absorption of calcium from the intestinal tract.

One clinical study of 328 cases of milk fever showed that calcium I.V. and Parterol I.M. were effective in 98% of the patients.[1]

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Parterol in 30 cc. multi-dose vials, each cc. containing 2.5 mg. dihydrotachysterol in oil.

Calsem, *Calsem-D* and *Calsem-DM* in 500 cc. vials.

1. Harris, J.R., and Clarkson, T.B., Prevention of Relapses in Milk Fever, Vet. Medicine, *12*:696 (Dec. 1955)

Write for detailed literature.

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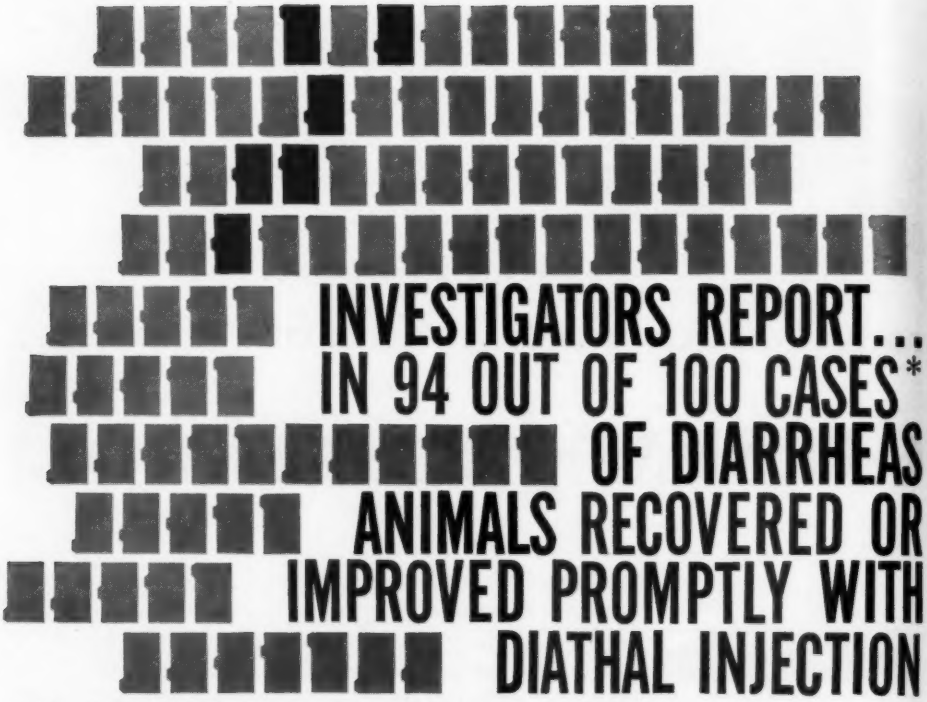

a distinct advancement in the control of problem diarrheas

DIATHAL exerts a *suppressive action* on gut motility, provides wide-spectrum *antibacterial action* against enteric organisms and has the added *protective action* of controlling nausea and vomiting associated with virtually all diarrheas of cats, dogs and horses.

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DIATHAL INJECTION

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*Good results in 226 of 236 cases reported to Clinical Research Division.

Davenport Heads Chicago Group

Dr. Mark Davenport, has been named president of the Chicago Veterinary Medical Association for 1959.

Dr. Mark Davenport

He is technical director of the Veterinary Department of Armour Pharmaceutical Company, which he joined in 1951.

Other officers elected are Dr. Jacque W. Neff of Hinsdale, president-elect; Dr. Charles Armstrong of Evanston, secretary; and Dr. Myron Bernstein of Glencoe, treasurer.

The Chicago Veterinary Medical Association has been in existence over 50 years and represents some 160 veterinarians in the Chicago metropolitan area.

Joins Research Labs

Dr. Carrell J. Kucera has joined Research Laboratories as an associate in biological research. In his new position, Doctor Kucera will direct development work in tissue culture, virology and bacteriology.

Prior to joining Research he was a reseach assistant at the University of Pennsylvania where he obtained his Ph.D. degree in 1958. He was awarded his Bachelor of Arts degree in 1948 and his Master of Science degree in 1952 from the University of Minnesota. From 1952 through 1955 Doctor Kucera was a medical bacteriologist for the U. S. Army Chemical Corp., Fort Detrick, Maryland.

The addition of Doctor Kucera to the Research team enhances the position of the Missouri firm in the growing field of veterinary product development.

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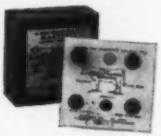

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The results of recently intensive clinical research revealed an anthelmintic that is highly effective in cattle. Individual animals were confined in special stalls and administered different phenothiazine drench formulations for testing. All urinary and fecal excreta were recovered and each excretion was individually analyzed chemically to determine how much of the dose went into the digestive tract and amount of the dose available for killing worms. Dosages were given on an identical basis.

GREATER CONCENTRATION

Results obtained from this modified formulation were better than that of unmodified drenches generally used. Tests show that modified formulations produced on the average 6 to 8 times more phenothiazine in the digestive tract in a shorter period of time than other drenches. For example, peak percentages (above 1%) of the modified chemical were obtained in only 17 hours post treatment while the average of unmodified formulations returned a peak percentage of less than .2% 40 hours or later post treatment.

Other effective products are Pro-Brand Kabtin, a nontoxic demulcent for control of diarrhea from dietary or simple digestive causes; Pro-Brand KZ, antiseptic fungicide for ringworms and mycotic dermatoses; Pro-Brand Chap-Et a protective ointment for application to udders to reduce swelling and soreness. For details write to Pro-Brand Products Company, P. O. Box 4186, Fort Worth, Texas.

Veterinary Calendar

Mar. 2-6. **Laboratory Diagnostic Methods in Veterinary Mycology,** short course. Communicable Disease Center, Public Health Service, Chamblee, Georgia. Dr. William Kaplan, Mycology Unit., Department of Health, Education and Welfare, P. O. Box 185, Chamblee, Georgia.

Mar. 15-17. **Alabama Veterinary Medical Association.** Annual Meeting. Houston Hotel, Dothan, Alabama. Dr. M. K. Heath, Auburn, Alabama, secretary-treasurer.

Apr. 6-8. **State College of Washington, School of Veterinary Medicine,** 11th annual conference for veterinarians. Dr. Robert W. Leader, conference chairman.

Apr. 7. **American Veterinary Radiology Society,** semi-annual meeting. Nassau Tavern, Princeton, New Jersey. Dr. J. J. Fishler, 3421 S. main, Elkhart, Indiana.

Apr. 13-14. **Oklahoma Conference for Veterinarians,** College of Veterinary Medicine, Oklahoma State University, Veterinary Medical Center. Dr. John H. Venable, chairman.

May 2-3. **University of Florida,** second Florida Conference for Veterinarians. J. Hillis Miller Health Center, University of Florida, Gainesville, Florida. Dr. W. R. Pritchard, program chairman.

May 7-9. **American Animal Hospital Association.** Annual Meeting. Municipal Auditorium, Colorado Springs, Colorado. Dr. Wayne H. Riser, 5335 Touhy Avenue, Skokie, Illinois, executive secretary.

Jun. 4-5. **Texas A. & M.,** 12th annual Texas Conference for Veterinarians. College Station, Texas. Dr. R. D. Turk, conference chairman.

Jun. 18-20. **Animal Reproduction Symposium.** University of Illinois, Urbana, Illinois. Dr. P. J. Dzuik, III Animal Genetics, University of Illinois, Assistant Professor of Animal Physiology.

Jun. 23-25. **North Carolina Veterinary Medical Association.** Morehead Biltmore Hotel, Morehead City, North Carolina. Dr. J. T. Dixon, 3026 South Main Street, Winston-Salem, North Carolina, secretary-treasurer.

Jun. 23-25. **Maritime Veterinary Associations,** joint conference. Mount Allison University, Sackville, N. B. Dr. P. D. McKercher, Box 310, Sackville, N. B., general chairman.

Jul. 13-14. **Kentucky Veterinary Medical Association,** 48th Annual Convention. Sheraton-Seelbach Hotel, Louisville, Kentucky. Dr. L. S. Shirrell, 545 East Main, Frankfort, Kentucky, secretary.

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Broad-spectrum antibiotic—oxytetracycline

Designed to support your initial therapy in herds and flocks

ECONOMY—the most economical vitamin-enriched broad-spectrum antibiotic for therapeutic feed supplementation.

CONVENIENCE—Space-saving, dispensing concentration 5 pound canister—25 grams per pound

EFFECTIVENESS—In Swine, Cattle, Sheep, Mink, Poultry Terramix A-B-D-25 has a wide range of antimicrobial effectiveness against gram-positive and gram-negative bacteria, rickettsiae, spirochetes, and certain viruses. Plus the treatment benefits of the addition of vitamins needed in many animal diseases.

PACKAGING AND COMPOSITION—5 pound canister—125 Grams. Each pound of Terramix A-B-D-25 contains 25 grams of oxytetracycline activity, plus 2,000,000 units of Vitamin A, 200,000 units of Vitamin D_3, 2 grams of Riboflavin, 4 mg. of Vitamin B_{12}, with expeller soybean oil meal as the diluent, Q.S.

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Also ask about our full line of quality LIFESPAN dry and canned diets, care and sanitation products.

McLeod Memorial Fund

A gift of $3,000 for the creation of a W. M. McLeod Memorial Fund unit of the Kansas State College Foundation for Veterinary Medicine, has been announced by Kenneth M. Heywood, director of K-State's endowment association.

The money, part of the sum collected by the McLeod Memorial Fund committee since Doctor McLeod's death, will be invested by the endowment association with earnings to be used for scholarships in veterinary medicine.

The Memorial Fund committee retained some of the money they have collected for the purchase of a suitable portrait of Doctor McLeod.

McLeod, who died in 1957, was a member of the K-State staff for 38 years and served as head of the department of anatomy for more than a decade. At the time of his death he was one of the top veterinary anatomists in the country.

Creation of the fund gives recognition to the esteem in which alumni held the late Doctor McLeod.

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2. MEDICAL ACTION... *Sulfathiazole* released slowly from within the Dilator provides broad antimicrobial protection; combats infection and reduces swelling; minimizes ascending inflammation and promotes healing.

WITH ANTIBIOTICS . . . Saturated with your favorite udder infusion antibiotic, Dr. Naylor Dilators are an ideal vehicle for additional local medication following teat surgery.

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dry and lactating cows

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- unique package

*design patented

FURACIN has been shown to be strikingly effective in controlling mastitis under field conditions.[1,2] Of 7,123 lactating cows with acute mastitis, fair to excellent results were obtained in 5,597 (78%). Of 3,418 dry cows which had had mastitis during their previous lactating period, fair to excellent results were obtained in 3,104 (90%).

SUPPLIED A water-miscible liquid of FURACIN 0.2% in polyethylene glycol and water. Single-dose SQUEEJET disposable dispenser of 30 cc. Still available, bottles of 500 cc. with rubber stopper and 1 gal.

1. Mires, M. H., and Chadwick, R. H.: Vet. News 10:3 (Jan.-Feb.) 1947. 2. Mires, M. H.: J. Am. Vet. M. Ass. 117:49 (July) 1950.

All Eaton Veterinary Specialties Are Available Through Your Professional Veterinary Distributor.

NITROFURANS—a *new* class of antimicrobials— neither antibiotics nor sulfonamides

EATON LABORATORIES, NORWICH, NEW YORK

You'll do better with Oster the Veterinarian's Clipper

Model A-2

Humane, efficient clipping and surgical shaving are easier, faster and more profitable with the smoother-running OSTER clipper. Detachable cutter head permits use of all sizes of cutting blades to do all clipping jobs the professional way.

John Oster Manufacturing Co.
5055 N. Lydell Avenue
Milwaukee 17, Wisconsin, U.S.A.

Dean Leasure Goes to India

Dean and Mrs. E. E. Leasure of Kansas State College are reported to be in Paris, France. Dean Leasure is on a mission to India with the International Cooperative Administration. This is the second trip the dean has made to India. It is expected that Dean and Mrs. Leasure will be gone about two months. Dr. J. W. Lumb, formerly associated with the Anatomy Department of Kansas State College, is taking care of Dean Leasure's administrative duties while he is away.

Marookian to Merck Post

Dr. Edgar R. Marookian has joined the staff of Merck & Co., Inc., Chemical Division, as region technical specialist.

Doctor Marookian received his D.V.M. degree from the University of Pennsylvania. Since 1954, he has been in private practice, and has participated in research activities. He is a native of Clinton, New Jersey.

CURTS **BOVIDOTE** CURTS

Laxative—Antacid—Detoxicant—Stimulant

(100% active ingredients)

℞ Each pound contains: Anhydrous magnesium oxide (quantity sufficient to make 1 gallon of milk of magnesia) with a therapeutic dose (8 oz.) of sodium thiosulfate; plus sufficient quantity of tartar emetic and nux vomica for rumen stimulation

The original formula emphasizing the chemical detoxifying action of sodium thiosulfate together with its laxative action

DOSE: Adult cows 1 lb. suspended in 1 to 3 gallons water via stomach tube

OFTEN IMITATED — NEVER EQUALLED

PACKAGES: Carton of 12—1-lb. sealed polyethylene bags
25 lb. plastic lined fiber drums

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Manufacturers of Veterinary Pharmaceuticals Since 1918

71 Central Avenue Kansas City 18, Kansas

NEW... *for C.R.D.*

FUROXONE® AERODUST
brand of furazolidone

VETERINARY

When winter weather or other stress "triggers" C.R.D. FUROXONE AERODUST sprayed over the roosting flock is an effective means of control. The fine, light, yellow powder hangs in air to be inhaled for 30 minutes or more, thus carrying the powerful bactericidal FUROXONE directly to the site of infection. A single dusting often cuts mortality—returns the flock to near normal feed consumption in 2 to 3 days!

FUROXONE AERODUST is available through your veterinarian. Ask him today about Furoxone Aerodust for C.R.D.

NITROFURANS— a *new* class of antimicrobials... neither antibiotics nor sulfonamides

EATON LABORATORIES, NORWICH, NEW YORK

Atlas

R_x DIETS FOR DOGS AND CATS

NEPHRODIET
ENTERODIET
PROTODIET
OBESODIET
FELODIET
BASODIET
GERIODIET

OLDER DOGS

Need More Than Just Food . . .

They Need GERIODIET

geriodiet

Diet, since it can be rigidly controlled, can be the greatest single factor in lengthening the life of the aging dog. GERIODIET, developed after extensive research in the Atlas laboratories, is the ideal maintenance diet for the older dog which develops metabolic changes with advancing age and which undergoes profound changes in tissues and organs. ATLAS GERIODIET will supply and fulfill all the nutritional requirements of the older dog.

- *adequate protein of good biological value*
- *all needed B complex factors*
- *proper proportions of fats and carbohydrates*
- *highly palatable and digestible*
- *fulfills all Vitamin and Mineral requirements*

The Atlas Research Center, in its continuous program of research and investigation into advances in therapeutic nutrition, is preparing new material for small animal veterinarians. Watch for this new literature.

AVAILABLE ONLY TO GRADUATE VETERINARIA

VM 1

Special Diets Dept., Atlas Canine Products, Inc.
Glendale 27, New York

Gentlemen:

Please send price list and professional literature o
Atlas Rx Diets for dogs and cats.

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ATLAS CANINE PRODUCTS, INC.

Glendale 27, New York

NOW . . . for the first time, a CONVENIENT, DISPENSING

"HANDY HANDLE" CARRY HOME PACK

For All

ATLAS Rx DIETS for dogs and cats

Because of the great demand for a dispensing, easy-to-handle carry-home package, Atlas Rx Diets are now available in 24-can cases with built-in handle. This new idea in merchandising case lot sales has been thoroughly tested and enthusiastically accepted by both veterinarians and their clients.

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Glendale 27, New York

infected eyes and ears respond rapidly to

FURACIN®

brand of nitrofurazone

Wide-spectrum, non-irritating nitrofuran in formulations especially adapted for the treatment of bacterial infections of the

eye

FURACIN
SOLUBLE POWDER VETERINARY

"FURACIN in its water-soluble base is completely soluble in body fluids. These properties make it ideally suited for the treatment of ophthalmitis and postoperative therapy."*

FURACIN Soluble Powder Veterinary is conveniently applied directly from the plastic puff-bottle.

These FURACIN products contain FURACIN 0.2% in water-miscible vehicles. Therefore, they may be left in wounds to be sutured.

Order plastic "puff" bottle of 10 Gm.
Available through your professional veterinary distributor.

ear

FURACIN
EAR SOLUTION VETERINARY

This anhydrous, water-soluble dosage form of FURACIN affords prompt relief of otic infections in small animals.

In canine otitis externa, poor drainage, plus the trauma of scratching and rubbing, often frustrates therapy. It is noteworthy that "FURACIN has been used successfully in this condition . . ."*

In cases of otitis in which exudate is present, you will find the drying effect of FURACIN Soluble Powder Veterinary to be most beneficial.

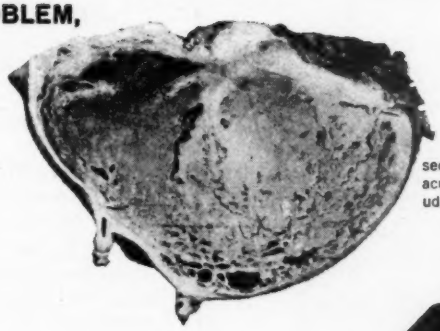
Available in dropper bottle of 1 fl.oz.

*Belloff, G. B.: Calif. Vet. 9:16 (Nov.-Dec.) 1956.

NITROFURANS — a new class of antimicrobials—neither antibiotics nor sulfonamides

EATON LABORATORIES NORWICH, NEW YORK

FOR AN OLD PROBLEM,



section of acutely inflamed udder

A NEW REMEDY IN A NEW PACKAGE

DIAGNOSIS: **MASTITIS**

MEDICATION: **SPECIAL FORMULA NO. 17900***

Hydrocortisone – combats inflammation

Neomycin, Polymyxin, Procaine Penicillin } combat infection

PROGNOSIS: **Excellent, even in advanced cases**

PACKAGE: **XPRESIT***

A disposable, easy-to-use container-applicator permitting rapid introduction of a complete dose through the teat canal.

Available in economical cartons of 12 Xpresits, each of which contains 10 cc. of the active ingredients in a nonirritating, milk-miscible base.

Try SPECIAL FORMULA NO. 17900 in the XPRESIT container on your next mastitic case.

*TRADEMARKS

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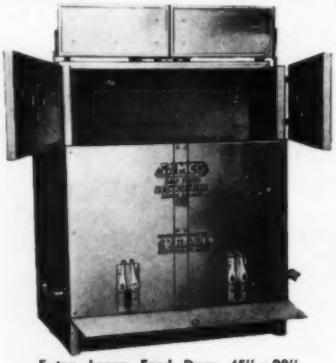
Upjohn

SAMCO
CREMATORY DESTRUCTOR
Gas Fired for
ANIMAL CARCASS CREMATION
(Engineered Special for Veterinary Practitioner)



Extra Large Feed Door 45" x 20"
Capacity 17 Bushel — 2 Burners
100% SAFETY AUTOMATIC
THERMO PILOT VALVE
Each Main Burner with Pilot Light and Timer Shut-off.
GREAT HEAT and FIRE POWER
Smaller Sizes Available
Investigate unique purchase plan for great savings
SYRALL MFG. CO., 511 N. State, Syracuse 3, N.Y.

Employment Opportunities

California is now seeking graduate veterinarians, with or without experience, to fill permanent, full-time positions in three of the major bureaus of the State Department of Agriculture. Openings, located throughout California, are with the Bureaus of Meat Inspection, Poultry Inspection and Livestock Disease Control.

No California license is required for veterinarians in the state meat and poultry inspection programs. For laboratory or field work, applicants must secure a license within 12 months of employment, but need none at the time of appointment.

Examinations will be held monthly, in a number of cities nationwide. The next final filing dates are January 27, for the examination date of February 24; March 3, for examination March 31; and March 31, for examination April 28.

Application forms and detailed information are available from the California State Personnel Board, 801 Capitol Avenue, Sacramento 14, California.

tested medicinals direct by mail

10cc Procaine Penicillin — Aqueous Suspension 300,000 Units per cc Standard Brand Expires February 1960	10 Vials	$ 3.10
	100 Vials	28.95
	1000 Vials	279.00
10cc Procaine Penicillin — 400,000 Units with ½ gm. Dihydrostreptomycin in each 2 cc Aqueous Suspension Standard Brand Expires September 1959	10 Vials	6.35
	100 Vials	58.00
	1000 Vials	560.00
1 Vial — Penicillin G Powder — 500,000 Units each Standard Brand Expires March 1960	10 Vials	1.60
	100 Vials	15.00
	1000 Vials	140.00
10cc Dihydrostreptomycin Solution — ½ gm. per cc Expires January 1962	10 Vials	6.25
	100 Vials	57.00
	1000 Vials	550.00
Tetracycline Capsules 250mg Standard Brand Expires 1961	100	26.00
	5x100	127.50
Penicillin Tablets — Soluble — 100,000 Units	100	1.35
	1000	12.00
	5000	53.00
Penicillin Tablets — Soluble — 200,000 Units	100	2.40
	1000	21.50
	5000	100.00
Penicillin with Triple Sulfas — 300,000 Units	100	4.80
	1000	36.00
5cc Acth-Gel — 40 units per cc Standard Brands	1 Vial	2.65
	10 Vials	24.50
	100 Vials	235.00
100 Chloromycetin Capsules 250mg		29.75
100 Chloromycetin Capsules 100mg		13.25
Prednisone or Prednisolone — 5 mg — Specify	100	4.90
	1000	43.00
	5000	205.00
10cc Vitamin B_{12} — 1000 MCG per cc Crystaline — U.S.P.	1 Vial	2.25
	10 Vials	21.00
	100 Vials	200.00
	1000 Vials	1900.00

Minimum Shipping Order $25.00. Postage prepaid. Check with order.

VETERINARY MEDICINE SUPPLY CORP. 130-05 LIBERTY AVENUE, RICHMOND HILL, N. Y.

Cable: Herblews New York Phone: MIchigan 1-5650 Prices subject to change without notice.

nationally known antibiotics, therapeutics, hormones, biologicals, vitamins and pharmaceuticals for all animals

Selling Veterinarian Services to the Farmer

as appearing in the spring issue of The FARM QUARTERLY

The Farm Quarterly — read by over 225,000 of the most progressive & prosperous farmers in the U. S. — your best clients!

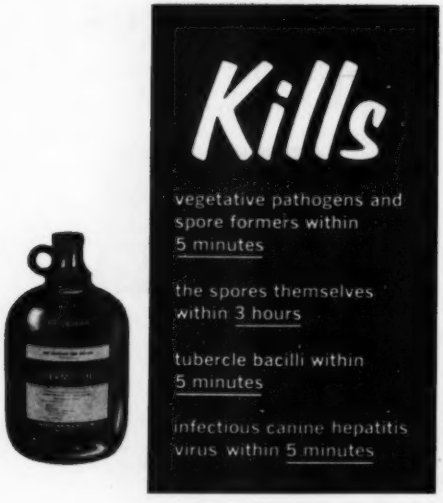
"Use your Veterinarian"! This is the subject of a Research Laboratories, Inc. advertisement currently appearing in *The Farm Quarterly*. This hard-hitting, public service message carries your story directly to the farmer. He reads *The Farm Quarterly* when he is most receptive to ideas, and uses it over and over as an important source of information.

Write today for free reprints of "Use Your Veterinarian".

RESEARCH LABORATORIES, INC.

Saint Joseph, Missouri

Manufacturing and selling veterinary products only to veterinarians


Kills
vegetative pathogens and spore formers within 5 minutes
the spores themselves within 3 hours
tubercle bacilli within 5 minutes
infectious canine hepatitis virus within 5 minutes

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FORMALDEHYDE GERMICIDE

This solution is specifically indicated for the practical and economical chemical disinfection of surgical 'sharps.' When used as directed, it will in no way impair keen cutting edges, points of hypodermic needles, scissors and other delicate instruments . . . an annual savings in instrument replacement and repair will far exceed the actual cost of the solution. If kept undiluted and free of foreign matter, it may be used repeatedly.

It's
SPORICIDAL
TUBERCULOCIDAL
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B-P INSTRUMENT CONTAINERS
Designed with your convenience in mind for use with Bard-Parker GERMICIDE

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B-P **BARD-PARKER COMPANY, INC.**
DANBURY, CONNECTICUT
A DIVISION OF BECTON, DICKINSON AND COMPANY

B-P is a trademark

ALL BARD-PARKER SOLUTIONS
CONSERVE THE BUDGET DOLLAR

Decker to Public Health Helm

Dr. W. M. Decker has been elected president of the Conference of Public Health Veterinarians for the coming year. Doctor Decker has long years of experience as a public health veterinarian, which include

Dr. W. M. Decker

service as Staff Public Health Veterinarian, Kalamazoo City-County Health Department; Milk and Food Consultant, Michigan Department of Health, and Public Health Veterinarian, of the same department. He is presently staff assistant to the state health commissioner.

Active membership in the conference is open to all veterinarians who are employed full or part time by any official or voluntary organization engaged in public health work. The conference holds meetings each year at both the annual meeting of the A.V.M.A. and the annual meeting of the American Public Health Association.

Miller Honored at M.S.U.

Harry E. Miller of The University of Michigan School of Public Health was cited recently for "noteworthy contributions to veterinary medicine."

A certificate of appreciation recognized Miller's leadership in developing the nation's First Institute on Veterinary Public Health Practice held at the University, October 6-9. The conference represented the first scientific attempt to merge the knowledge of veterinary medicine and human medicine for the benefit of public health.

The presentation was made by Professor H. J. Stafseth of Michigan State University,

Department of Microbiology and Public Health, and a member of the planning committee for the veterinary conference.

Miller is director of continued education at the U-M School of Public Health.

Brinkman Joins Pitman-Moore

Dr. David C. Brinkman has joined the staff of Pitman-Moore Company's veterinary clinical research laboratory, it has been announced by Dr. C. A. Bunde, vice president in charge of research. Doctor Brinkman will engage in cancer studies at the firm's research center.

Born and reared in Washington, he received his D.V.M. degree from the State College of Washington at Pullman. He also did three years of graduate work in Veterinary Science.

For three years Doctor Brinkman was an instructor at the state college and was in practice for four years. During World War II he served in the U. S. Army with overseas duty in the Philippines.

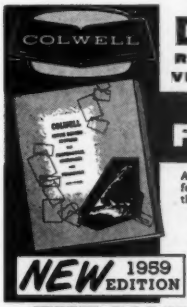
Many companies are trying to "imitate and duplicate but have failed to formulate!"

GENUINE

OCUROL-VET

The pinkeye medicine of choice among leading veterinarians around the world. Order from your favorite veterinary distributor.

THE OCUROL-VET COMPANY ★ SABINAL, TEXAS



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A complete line of Record Supplies and Professional Stationery designed specifically for the medical profession.

- Financial Record Book
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NEW 1959 EDITION

THE COLWELL COMPANY
283 University Ave., Champaign, Ill.

New—for instantaneous use

LIQUAMYCIN*

OXYTETRACYCLINE SOLUTION

A sparkling clear solution of the broad-spectrum antibiotic, oxytetracycline

The diversified conditions under which veterinary medicine is practiced call for a broad-spectrum antibiotic designed for rapid, systemic effect and offering the maximum in convenience, economy and versatility.

A 100 cc. LIQUAMYCIN bottle contains 12 grams of oxytetracycline in solution. Each cc. contains 25 mg. of oxytetracycline.

Convenient—A sparkling-clear, stable solution for easy and instantaneous administration. *Economical*—A therapeutic, systemic dose at minimum cost. *Versatile*—Oxytetracycline has no surpassed 3 years record of clinical success in a wide variety of infectious diseases.

Exclusive—Liquamycin is sold only to veterinarians.

Department of Veterinary Medicine

PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y.

*Trademark

Pfizer

NEOJEL
PATENT PENDING

makes the difference...in

NEO-VAC

ERYSIPELAS-BACTERIN

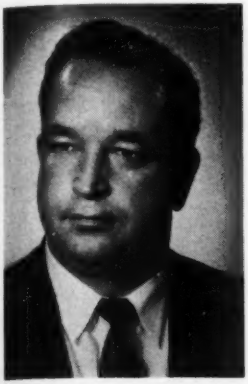
...and here's why it makes a difference

★ Longer Immunity
★ Well Tolerated
★ Lower Dosage

DIAMOND LABORATORIES
DES MOINES • IOWA

To Diamond Post

Colonel V. Transue was recently promoted to Assistant Sales Manager at Diamond Laboratories in Des Moines, Iowa.



Colonel V. Transue

He has spent the past 11 years in the medical supply field, of which the last two were spent in Walnut Creek, California, as Western Regional Manager for Diamond.

Colonel Transue assumes his duties at the new Diamond post as soon as orderly transfer of business is accomplished.

Laboratory Service for Veterinarians

VETERINARY DIAGNOSTIC LABORATORIES

These laboratories have been established to aid veterinarians in the diagnosis of obscure as well as common ailments in large and small animals. The chief aim of our staff is to give quick and accurate diagnosis at all times.

Our service includes fecal examinations, anti-biotic sensitivity tests, urinalyses, blood counts, tissue sections, bacteriological cultures, cultures for ringworm and blood chemistry. It is designed to assist owners and breeders of stock of all kinds including dogs, cats, horses, cattle, poultry, hogs and sheep.

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Ship journals parcel post. Within thirty days after receipt, bound volumes will be shipped prepaid anywhere in the U.S.A. Full remittance must accompany order.

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Some Things To Think About Erysipelas Vaccines

...to obtain maximum effectiveness & safety

The inventive gentleman who first used the wheel had a basic idea, and so far no one has come up with anything better for its purpose.

If you'll waive the dissimilarity between wheels and swine erysipelas vaccines, we'd like to point out the fact that some major improvements have been made in erysipelas immunization since the early days of E. rhusiopathiae vaccine marketed under limited conditions.

In 1955, when Norden announced the first live culture, Erysipelas Vaccine Avirulent (EVA) to the veterinary profession, it's departure from the then current concept of erysipelas immunization caused some to take the "wait and see" attitude. But EVA's advantages soon became apparent and acceptance spread nationwide. Millions of doses have now been used on farm premises.

If this sounds like we're prejudiced, let's examine the facts.

1 **A swine erysipelas vaccine must be safe.** Live culture is highly virulent and far from safe, while killed products are obviously self limiting. Norden's bio research division studied domestic and foreign avirulent erysipelas strains for years to produce an effective yet safe live culture vaccine. The result is EVA, a vaccine which is totally avirulent or non-pathogenic to mice, pigeons, guinea pigs, turkeys, sheep, swine and humans.

2 **An erysipelas vaccine must produce immunity.** Otherwise the vaccination effort and cost are in vain. EVA is an avirulent **live culture** vaccine. The result is a rapid, high antigenic response. Field trial data, submitted in support of license application and three years of field usage, conclusively demonstrate that EVA vaccination is a superior method of swine erysipelas immunization.

3 **An erysipelas vaccine should not seed premises or cause vaccination reactions.** Virulent live erysipelas culture is hazardous to handle and has long been noted for its ability to perpetuate premise infection. Because EVA is avirulent, it cannot cause premise infection. Furthermore, it will not cause undesirable vaccination reactions.

4 **An erysipelas vaccine should be suitable for a wide range of conditions.** Norden EVA is perfectly safe in any swine age group from suckling pigs to venerable brood sows, and may be used on part of the drove without spreading infection to unvaccinated swine. Bred gilts or pregnant sows may be vaccinated with EVA if accorded reasonable care. The dose is 2 cc, regardless of age or weight.

EVA®-Cyclic Year Around Control Plan

(The Clincher)

Year around protection against erysipelas in your clients' droves is possible with EVA and the Cyclic Vaccination Plan. Cyclic vaccination is a plan developed by the USDA based on the knowledge that efficient disease control usually depends on starting with, and maintaining, disease resistant breeding stock—in this case EVA-vaccinated sows and gilts.

Briefly the EVA-Cyclic Vaccination Plan consists of vaccinating sows and gilts with EVA 30 days before or after breeding, or 30 days before farrowing, thus establishing immunity in the breeding herd. Pigs nursing EVA-vaccinated sows will usually be immune to erysipelas through six weeks of age. Pigs are vaccinated at 5-6 weeks of age, and the immunity so established protects them through market age. The cycle is started again by revaccinating sows and gilts saved for the breeding herds.

EVA vaccinated hog. Scarification skin test proves solid immunity when challenged at 210 days. No local or systemic reaction.

You'll find that the cyclic vaccination program is highly effective, even on problem farms.

More Information

The 4-page reprint on EVA will give you more information on the product's research and testing. Also available is a colorful brochure free in quantities for client distribution. Ask your local Norden representative or write direct.

EVA is supplied in: 5-2 doses; 5 doses; 25 doses; 50 doses. Each with sterile diluent.

NORDEN LABORATORIES

Norden Laboratories **Lincoln, Nebraska**

Analgesic POWER

DEMEROL HYDROCHLORIDE ranks between morphine and codeine in analgesic power. Furthermore, it possesses marked spasmolytic and mild sedative action. It causes less nausea and vomiting and less urinary retention than morphine, and no constipation. The danger of respiratory depression is also greatly reduced with Demerol hydrochloride. *Warning: May be habit forming.*

Preanesthetic agent in dogs, for relief of colicky enteritis and intractable cough, asthma and other respiratory tract pain.

Particularly useful in any instance in which pain is a factor in the handling of a patient.

Well tolerated in cats.

For oral, subcutaneous and intramuscular administration.

Ampuls of 1 cc. (50 mg.); 2 cc. (100 mg.); vials of 30 cc. (50 mg. per cc.); tablets of 50 and 100 mg. *Narcotic blank required.*

Demerol®
hydrochloride

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1450 BROADWAY | NEW YORK 18, N. Y.

Demerol (brand of meperidine), trademark reg. U. S. Pat. Off.

For prevention

of hog cholera

CORVAC Hog Cholera Vaccine

A standard, well-known, modified live virus hog cholera vaccine for use with 10 cc. of serum or 5 cc. of SERATRATE. CORVAC, like all other CSL products, is available only to the veterinary profession.

SERATRATE, H.C.

Hog Cholera Antibody-Concentrate

The globulin fraction of hyperimmune porcine blood, adjusted to at least twice the potency of anti-hog cholera serum. New convenience for modern practitioners, available now in 250 cc. vials cartoned in dozens.

CSL

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